# COMPUT **ERWORLD**

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Comnet attendees skeptical about the promises of ISDN, Page 4.

Honeywell's first annual deficit marks a tumultuous year. Page 14.

powers Amdahl retort BY JEFFRY BEELER SUNNYVALE Calif - Amd Customers who want to up-ade installed 5890s to the E-ries equivalents can do so by Corp. last week countered IBM's latest 3090 mainframe family enhancements with the intro-

Five-model 'E' series

duction of a three-way processor that reportedly delivers approxi-mately 8% higher price/perfor mance than its Big Blue counter Amdahl Corp. Total sales in mil

The company also replaced its four existing Series 5890 main-frames with enhanced 3090class alternatives that cost the same as their predecessors but offer 4% to 13% more throughoffer 4% to 13% more through-pst. With the announcement, Amdahl renamed all four of the previous 5890s — the 5890-190, 5890-200, 5890-300 and 5890-600 — by adding the des-ignation "E" at the end of each sber, just as

The three-processor 5890-400E and the rest of what the vendor called the E-series modeis reportedly owe their in-creased performance to randomaccess memory chip and logic refinements that can be retrofit-

work diagnostic and monitoring systems to feed data to IBM's

cessor systems marketing. eld upgradability of Am-

### Reluctant Netview family of host-based network management systems. But st the Communication Networks Conference and Exposupport for on last week, vendors, users and analysts pointed out gaps in the Netview umbrella, particu-**Netview PC** larly is the data manipulation and presentation areas. In addition, several exhibitors said they were unwilling or unable to integrate

BY ELISABETH HORWITT WASHINGTON, D.C. - The their proprietary network statis-tics analysis and reporting sys-tems with IBM programs that are currently designed to man-age only IBM/Rolm Corp. netame vendors and users that are sublicly supporting IBM's Net-riew PC scheme privately harview PC scheme privately nar-bor grave misgivings about the consequences of adopting it as a network management standard. About 15 vendors are cur-rently writing hooks to Netview PC, which will enable their netork equipment.
One attendee, a comm

tions manager from a major in-vestment company that is cur-rently evaluating network and network management systems, complained that Netview PC gathers information from diffors' systems but lacks an application to put that data into usable form." Since ent application for doing this. How am I going to get a common syntax so f can use it?"

# Apollo disperses power

Net scheme offers distributed applications processing

BY ROSEMARY HAMILTON

CHELMSFORD, Mass. — Apol-lo Computer, Inc. laid the groundwork last week for an amstrategy that could radically change the way engineers and

The Network Computing System is intended to provide users with the shifty to split appli cations into portions that would be farmed out to various computing resources on a heteroge-neous network for simultaneous computation. While other ven-dors have provided tools to share files or access data among het ous systems, there are erogeneous systems, tower are no commercially available prod-ucts comparable to the Apollo system, according to analysts. However, Apollo's system will not be svasiable until the third quarter. Company officials said that some of the tools are at

chnology.

week. Apollo currently resells Alliant's minisupercomputers as Apollo Domain network comute servers, which process irge jobs that smaller workstanns cannot handle The Space and Technology Division of TRW, Inc. has been seta site, but it has not yet made s decision, according to Thomas

a few user sites but declined to name them. One vendor, Alliant Computer Systems Corp., an-nounced its support of NCS last

Heim, manager of engineering computation at the division. "We're thinking about it, and if they can do it, then they have a hell of a leg up on everyone else," Heim said, "ft sounds bke According to Edward Zander.

Apollo's vice-president of marketing, the company plans to proceed slowly with the new "We have some Continued on page 6

# Criminal past of IEEE officer went undisclosed

Few members knew of computer-aided heist

BY JEFFRY BEELER WASHINGTON, D.C. — When Stan Rifkin announced his candidacy last spring for lo-cal office in the Institute of Electrical and Electronics En ers, leaders of the ass

tion's section here publish professional biography.

But what the local lead ship of the world's largest pro-fessional society neglected to less than 1% of whom strend-

ed the subsequent election meeting — is that Stanley Mark Rifkin is a convicted fel on who, in 1978, mastermind ed one of the most sen computer crimes ever. In 1982, he ended a three-year sentence at California's Ter-minal Island Prison for electronscally diverting \$10.2 mil-lion from Los Angeles-based Security Pacific National Bank to his personal account at a



New York bank. The omission of Rifkin's criminal history did not result from ignorance among the lo-cal IEEE officers who authorized his run for a directorship in the association's Washing-ton, D.C., section. On the con-trary, "his past was well trary, "his past was well known both to me and to most ers of the section's Ex-

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# The Solution unravels at Hartford Insurance

BY DAVID A. LUDLUM HARTFORD, Conn. Hartford Insurance Group has withdrawn from the market its programmer productivity soft-ware, The Solution, and all but closed Hartford Integrated

Technologies, Inc. (Hitech), the subsidiary it set up 19 months rket the pr Almost a year to the day after announcing licensing agree-ments with third-party vendors and a joint marketing agreement with Wang Laboratories, Inc. — the maker of the hardware that

tech is dissolving these pacts.

Wang, which hoped The Solu on would bolster its effort to become a major supplier of data processing equipment, is evalu-ating whether it will continue to market the software, a Wang

The Hartford Insurance Group eloped in-house for autom ing its software development and maintenance, has been acquired only in limited test versions, ac-cording to the Wang spokesman, Edward Clough. The sales involve "smaller

versions in-house to basically lack the tires," said Clough, who declined to disclose how many companies are testing the prod In announcing The Solution a ar ago, The Hartford and

year ago, The Hartford and Wang said they were targeting a modest goal of 10 full-blown intions for 1986. The Solution has failed to sell

primarily because potential cus tomers are not willing to provid the support the system rea in areas such as training and de-velopment of methodologies, ac-cording to John T. Crawford, di-

rector of information management for the Hartford and former president of Hitech. "We didn't find many ready to make that kind of commitment," Crawford said. "We have mutually come to the conclusion that we couldn't afford to continue this in the full-scale basis, primarily because the market wasn't ready to do what we wanted it to do."

itech's product runs on - Hi-Clough said Wang anticipated that The Solution would have a long selling cycle because the concept behind it must be sold before the product. He estimated the cost of The Solution in a model configuration

for 40 software professionals to be \$27,000 per user, or \$1.08 Thus far, The Solution, which million. The software runs on Wang VS hub computers and ng Professional The Hartford will try to keep Hitech running as a shell, with one executive, and to sell pieces

of The Solution, Crawford said. The first piece will be Score board, which is for quality con trol in Cobol development and

The company formed Hitech in July 1985 to sell The Solution. At its peak in the middle of last year, the subsidiary employed 26 people, Crawford said. He con-firmed that it lost money but declined to say how much.

## IBM silent on Fuiitsu case BY ALAN ALPER

NEW YORK - IBM last week declined to discuss a report that it has reached a partial settle ment of a dispute with Fujitsu Ltd. in Tokyo that involved the panese company's alleged con rued infringement of a main

ame operating system According to a report in a Jap-ese newspaper. Fuiltsu has anese newspaper, Fujitsu has agreed to pay IBM \$65 million a year to use its version of the

MVS/XA operating system. An IBM spokesman decline comment on the matter. Sources knowledgeable of the situation said the \$65 million anof Fujitsu's current mainfram of Fujitsu's current meantrame sales. They questioned, howev-er, why IBM did not press for back damages. "Perhaps (IBM) did not want to ask for too much and put Fujitsu out of business." sinframe business said. "It ould have looked too hostile if

The two companies have been engaged in a year-long but-tle before the American Arbitration Association regarding charges that Pujitsu violated a 1963 agreement under which it 1983 agreement unser which it was supposed to pay IBM an un-specified sum and allow periodic inspection of its systems soft-ware. IBM charged that Fujitsu copied IBM's MVS/XA operating system in creating an operat ing system for its own line of

tement, Hitachi was to pay IBM on a sliding scale, sources said. The initial figure was reportedly \$400 million, sources said last week. Certain requirements were eased by IBM late last year. Fujitsu could not be reached

plug-compatible mainframes. Under terms of its 1983 set-tlement, Hitachi was to pay IBM

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traiers, total and sub-total capabilities provide flexible formatting

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# Users skeptical about ISDN benefits, support

BY DONNA RAIMONDE WASHINGTON, D.C. - De-

spite the rush by telecommun cations suppliers to develop into (ISDN) products and services users remain skeptical about immediate benefits of the technol ouv and the likelihood of ade quate service support Potential ISDN users who

ere interviewed at the Commu ation Networks Conference and Exposition (Comnet) last week pointed to the 1990s as a likely time frame for widely avail-

ISDN promises simultaneous high-speed data and voice trans-mission, interactive voice mail, call management and messaging and switched-host access. While it enhances or replaces Centrex services and adds value to the plain facilities telephone compa-nies offer, only the pioneer customers are likely to fare well in

The second tier of users will

they will get less attention from the vendors, according to T. Doune Procy segior telecon ications consultant at Inter-neal Data Corp. (IDC).

"If the customer is not in the limelight, there is little recourse

for solving problems," said Mi-chael J. Vonder Heide, voice network manager at Ace Hardware Corp. in Oak Brook, III. Ace, a co-operative of 5,000 hardware stores and 13 distribution cen ters, is in the process of cutting over to AT&T's 5ESS ISDN-

ble digital switch. Ace is in the early stages of planning for ISDN. "We're watching the McDonald's Corp. ily. We want to be on the cutting edge, but we will wait and because its still in its infan-"Vonder Heide said.

'ISDN is coming bec with," IDC's Perry told about 200 attendees at an ISDN ses-

one common access point to the network that gives all the ser-vices we need," be said. 'Pricing vague'
But vendors will not sell the ISDN services to customers un-

til they can show a cost/benefit relationship. "The pricing is y vague oow," Monk said This thought was echoed by Richard Kuehn, president of RAK Associations in Cleveland, who spoke at the ISDN session. "I worry that it will wind up like Videotex. Everybody loved it but wouldn't pay for it," he com-

Loren Henry, director of ISDN planning at regional hold-ing company U.S. West, a firm that is holding several ISDN tri-als, intimated that cost savings would accrue to customers because there are several pieces of equipment they would not need

to buy, such as cluster control-lers, integrated voice/digital hardware, analog-to-digital net-

Several network equipment endors said they are unwilling to make their own network man nent systems subordinate to IBM's, claiming that their own systems offer features that Net-

winces.
"We think IBM's network management system should feed data to our system — not vice versa — because we have the strong operator interface, we're not sure the Netview Po hooks work both ways," said Case Communications, Inc. Se-nior Director of Product Marketing Art Alberding. Case is one of several vendors evaluating the

cols as a way for network products to pass management data across networks, he said. IBM's Thoenen admitted that Netview's operator interface ks graphics, adding that up until recently at least, IBM has

"concentrated on quality in its network management prod-ucts... Now it's time to concentrate on presentation. Despite their criticisms of the protocol, a number of vendors at

Comnet have announced intentions to support Netview PC.
Netview PC's only apparent rival in the standards sweepstakes is a set of network mangement administration proto-ols that AT&T is working on

ment makers," according chard Snowden, director of AT&T's Concepts Developm

### FCC under While he said he does not ex-nect to see ISDN become fully available until the 1990s. Joseph fire from Monks, a manager of marketing at General Electric Co. in Bridgeport, Conn., said ISDN service will become vital. "The carriers best part of it is that we will have

BY MITCH BETTS

WASHINGTON. AT&T, MCI Communi Corp. and U.S. Sprint Cor cations Co., all hit by recent finuncial losses and layoffs, last week blasted the U.S. Depart-ment of Justice proposal to allow the regional Bell holding companies to offer limited long-dis-

The remarks, made here at the Communication Networks Conference and Exposition, sug-gested that the three major longoffa will capture significant amounts of long-distance busi-ness. The International Communications Association, a major business users group, has warned that the Bell holding companies could eventually put MCI and U.S. Sprint out of busi-

ness (CW, Feb. 91. In the most strident criticism, MCI President Bert C. Roberts Jr. said the department "com-pletely ignores the fact that al-lowing the [divested] Bell operst-

long companies to offer any long distance service puts them, once again, in direct competition with companies such as MCI. Roberts said the department

ongly views the three longdistance companies as healthy giants. He said they have been attered by multimillion-dollar nancial losses and employee layoffs, while the regional Bell holding companies each had profits of about \$1 billion last year and have gone on a buying

Unsympathetic officials Officials from the Justice Depart-ment and the Federal Communications Commission were not sympathetic. Charles F. Rule, acting head of the Justice Department's antitrust division, said he recognizes that the Bell companies could put more pressure on the profit margins of MCI and U.S. Sprint but said the

tect competition, not competi-Likewise, Albert Halprin, chief of the FCC's common carrier bureau, said it is impossible for MCI and U.S. Sprint to turn a expensive nationwide networks, just as it is impossible for a hotel owner to make a profit in the first two years after a new hotel is

But MCI President Roberts charged that the Justice Depart-

# Netview PC

Users are interested in Netview and Netview PC's potential for providing a centralized multi-vendor network management ystem with a consistent user interface but "aren't rushing into s," according to Thomas onaid, a partner at consulting and software company MGT Technology Group. "Applications have to be written b Netview PC is usable, and most users feel that while they'll need a central management facility someday, it isn't critical today, McDonald said.

Sometime in the second half of this year, when Netview PC omes commercially available BM will offer network manage cept data through the Netview PC interface — but only data that is generated by IBM and IBM/Rolm products, IBM senior marketing support representa-tive David Thoenen said.

The vendor has announced general-purpose service rou-tines that use Netview PC as an interface between other vendors' network management sys s and collection areas in the IBM host. One such program is a VTAM-based interface that en-ables Netview PC to send alarm data to a Netview program. A second program transfers batch es of network statistics, such as call-detail records, from Netview PC to an IBM CICS-based file-

catcher program residing on the host, according to Thoenen. A number of vendors are de-veloping programs that will al-low their systems to send niarm statistics to Netview PC and on

to the Netview program for alarm collection and filtering. But while IBM/Rolm offers a CICS-based program to collect call-detail record statistics from a Rolm CBX private branch ex age, there is no CICS applicafor analyzing statistics from other vendors' systems, according to McDonald

"Everyone agrees on what kinds of network alarms you need, but there are far more poses with usage accounting or traffic analysis — so they are far harder to standardize," Donald pointed out.

And IBM is leaving it up to users and vendors to resolve this issue, "We don't know whether vendors will write CICS programs from scratch or write the code to merge their products with ours." Thoeses said.

IBM's appropriate of a Netview-based industry standard could hinder rather than help its accep-

tance, the investment firm manager suggested at Comnet. Every vendor I've talked to is leathe to give over control of its networking products to IBM. This is a great opportunity (to come up with a standard) for a

with "several other companies — principally customer-premise third-party winder that people aren't afraid of," the manager

The second secon Compartment R. Back SPAD:

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# **Token-Ring keys missing**

BY PATRICIA KEEFE

WASHINGTON, D.C. — Users attend WASHING JON, D.C. — Users attend-ing last week's Communication Networks Conference and Exposition (Commet) here indicated they are more than willing to wait for IBM to release the various pieces of its Token-Ring network but that for planning purposes, they want to know exactly what it is they are waiting for. Yet many reported they did not get the information they were hoping to find.

"I'm not sure if we can wait for IBM to nm not sure if we can wait for IBM to answer our questions about the Token-Ring," said Craig Cushman, a telecom-munications analyst for Steelcase, Inc. in Grand Rapids, Mich. Steelcase is re-searching network technologies, includ-ing Systems Network Architecture, Manufacturing Automation Protocol (MAP) and IBM's Token-Ring, "We've set up MAP pilots on a limited basis," he said.

d getting onswers shiran, who described himself as a data ns manager, said he was not getting the answers he needed from IBM. "You can decide on the technology when looking at the theory to see if it makes sense," he commented. "But that doesn't mean you want to throw out all you know and install something you know little "If we wait for IBM, we'll he left wait-

### FCC under fire CONTINUED FROM PAGE 4

business restrictions that were considered essential to the AT&T divestiture accord and opens the door to "the same kinds of anticompetitive abuses that were so common during the Bell system years." He urged the U.S. Congress to in-

vestigate the proposal.

The Justice Department on Feb. 2 urged U.S. District Court Judge Harold H. Greene, who administers the AT&T dititure decree, to remove the ban on Bell company participation in information processing services and equipment manufacturing and to allow them to offer long tside their reg

The department argued that the di-vested Bell operating companies should not be allowed to offer long-distance service that originates or terminates inside their territories, because there they have monopoly power over access to the local

exchange. AT&T President Robert E. Allen said he was puzzled by the Justice Depart-ment's deregulation proposal because the local exchange monopoly identified in the 1982 divestiture decree still exists.

"If there was merit to the concern about mixing local monopoly service with long-distance competitive services or to the concern about a monopoly provider also manufacturing its own equipment... they still have merit, "Allen said." On the other hand, if these were trivial concerns. a very cruel joke has been played on the

for regulatory and legal affairs at U.S. Sprint in Kansas City, Mo., warned, "I you let the regional Bell holding companies in [long distance] now, you would destroy competition, not enhance it."

ing at the train station," complained an at-tendee from GTE Corp. at a session cov-ering IBM's Token-Ring and AT&T's Starlan. The GTE executive was very critical of the speed with which IBM has on delivering the pieces of its Token

been delivering the pieces of its Token-Ring and its responsiveness to GTE's in-quiries on the subject. He also complained about the inability to link the IBM Sys-tem(36 to the Token-Ring today. "We all have that frustration," said Thomas M. Hadley, a consulting support representative with IBM in Research Triangle Park, N.C., responding to com-plaints that IBM is just not moving fast

enough with its network plans. "But it takes time to develop hardware and soft-

"We can only produce so many lines of code a day," added David Leo, a Telecom-munications Marketing Center consulting mentations marketing Lettler consuting marketing support representative with IBM's Information Systems Group in Re-search Triangle Park. One user noted GTE is on the "bleeding edge" of technol-ogy. Under pressure from its own cus-tomers to install the Token-Ring, GTE is rally eager for IBM to reveal and release the missing pieces of its communica tions strategy, he said

Not everyone is quite so concerned with the pace of IBM's Token-Ring an-"Look, people don't expect IBM to be leading-edge. Maybe IBM is a little be-hind, but eventually they'll get their act ogether, and it will work," said Thomas McDonald, a consultant with the Waltham, Mass-based MGT Technology

Every one of my large (Fortu 1,000] IBM users is asking me about Token-Ring, but they don't understand what it's for or where it fits," McDonald com-

Many companies are still evaluating networks because up until very recently, network use has been driven by end users sking departmental networks past MIS. Steelcase is one example in which personal computer networks have been installed through user departments, but that is changing, Cushman said.



# DEC adds low-cost entry to VAX

Ties systems in clusters but withholds Q-bus expansion

BY NINAMARY BUBA MAGINNIS

BOSTON — Digital Equip Corp. is aggressively positi itself in the workstation market in which it enjoyed considerable success last year, with its low cost Vaxstation 2000 and Micro vax 2000, according to industry watchers and DEC competitors. The machines were unveiled iast week along with provisions for tying DEC's smallest VAXs

together in clusters. The single-user Vaxistation 2000 and multiuser Microvax 2000 are based on the 0.9 million instructions per second Micro-vax II chip. An optional expan-sion box can add up to 166M bytes of external storage. "The black-and-white Vaxstation II is replaced by this [Vaxstation 2000], except if you need expan-sion capabilities provided by the Q-bus," said Jeffrey C. Kalb, DEC's vice-president for lowend systems and technologies DEC will announce its 2000-series color service within months

ry, not replacement rever, DEC gravely limit the expansion capabilities of the new systems by not including a Q-bus backplane. Officials said the 2000 series is intended to be an inexpensive way to get into the VAX architecture, not a re-

placement for existing machines.
"They're trying to leverage
the fact that this is low-end, and
you've got all this VAX architecture behind you if you need to grow," agreed John McCarthy, ager at Cambridge, Forrester Re-Mass-based

search Inc. Although the 2000-series stems can run as stand-alones. ey are designed for local-area Vaxclusters a technology an-

nounced last November. To assist customers in install-ing low-end Vaxchasters. DEC includes a one-year, on-site war ranty in the purchase price, according to DEC'a Kalb. Low-end Vaxob Microvax II or larger VAX machine as a central cont chine as a central controlling boot node and can link up to 13 Vaxstation 2000, Microvax Vaxstation 2000, Microvax 2000, Vaxstation II, Vaxstation II/GPX or Microvax II machines. 'It all looks and acts as one big

"It all looks and acts as one tog system. Everyone works from the same data." noted Neil Bal-dridge, vice-president of Compu-share, a Lubbock, Texas-based beta-test user and DEC valued reseller. added reseller.
"If you need more than 140M bytes of disk space, the logical move is to go into a cluster environment," Baldridge said. Peripherals installed on the boot

'Not the way people work' Low-end clustering is DEC's an-swer to off-loading processing power when the Microvax II be-

Forrester Research's McCar-thy. Other workstation vendors include Microsoft Corp. MS-DOS operating system function ality for users who want to run such business applications as Lo-tus Development Corp.'s 1-2-3, he said. With DEC, "if you want personal computer functionality, you've got to have a Vaxor and Vaxetation on your desk, and at's not the way people work,

McCarthy said.

DEC officials claimed their low-end workstation is not pitted against other workstation vendors such as Chelsmford, Mass. ed Apolio Computer, Inc. and nuntain View, Calif.-based Sun Microsystems, Inc. But Edward J. Zander, Apollo's vice-presi-dent of marketing, said, "DEC has been chasing us for the last

four years trying to get into this DEC's 2000-series v tions, which share the VAX ar-chitecture and DEC's VMS operating system and Ethernet networking scheme, will head off

are opting for Sun equipment predicted Sonny Monosson, pub-lisher of "Monosson on DEC." Because the Vaxstation 2000 also runs Ultrix, a Unix operat-ing system based on the Univer-sity of California at Berkeley Unix 4.2, the workstation can run as an open aystem using Sun'a Network File System gateway, Sun'a converged Unix erating system includes Ver 4.2, 4.3 and System V, said John A. Hime, Sun's marketing director. "If you start talking to the U.S. government and large corporations, the strong mes-

The Microvax 2000 works well as a computer server but does not allow programmers to work on driver development because the system lacks a Q-bus, accord ing to beta-test user Wends Koenig, systems development tager for the Burlington, sa.-based Ziff-Davis Technical Information Co. If the boot node fails, the entire system is inaccessible, Koenig said. While boot-node failure can hamper op-erations, it has not caused prob-lems at Ziff-Davis, Koenig said.

Edward D. Jones & Co., a St. uis-based brokerage firm, has been evaluating the Microvax 2000 since September, accord-ing to Rich Malone, general part-ner responsible for data processing. The firm operates an IBM 090 Model 200 and a 3083 and said it plans to replace its dumb Unisys Corp. terminals, located at 1,100 branch offices across the country, with intelligent systems. After evaluating both DEC

and the IBM Personal Compute line, Jones ranked the Microva 00 as superior, Malone said. Although no orders have been aced vet, each branch office will probably run a Microvax 2000 with two terminals and a printer, Malone reported.

Apollo

tools, and that's a start. We have a ways to go here, but we've hit a

nerve with our customers. So we'll take it real easy. We're still shaking it out and learning about it," Zander commercial The NCS, designed for a het-

erogeneous environment, will be initially available for Apollo sys-tems, other Unix-based systems and Digital Equipment Corp. VMS-based systems, according to the vendor. Apollo will also provide source code for other vendors to create the necessary software and compiler to run NCS in their environment. It can support common industry standard networking protocols, in-cluding the Transmission Con-trol Protocol/internet Protocol sage is to operate System V." be

and IBM's Systems Network Ar-chitecture, Apollo said. With the intent of promoting NCS as an industry standard, the vendor will make public th

specifications for its Netwo Computing Archit which NCS is based. Architecture, on

The new system is targeted at both large sites, where in-house pro-

grams used work - a key productivity issue at large enshelf gineering installations. also be able to port existing applications

to the NCS environment if those programs are based on a strucprograms are based on a struc-tured inguage such as C, Apolio spokesmen said.

If vendors and users support the Apolio system, users will eventually be able to write and

buy software that can take ad vantage of the shared-computi ent. This would enal users to optimize the various computing resources on a network, a key productivity issue at large engineering installations, industry analysts said.

A user at a workstation could bring up an application, and sub-routines of that application could be remotely processed at a num-ber of nodes. Without NCS, a user would run the entire app cation at his desk, while oth systems on the network could be

Assigning subroutines Furthermore, the Apolio system will be able to assign subroutines to systems that are more suited to processing these subroutines than the workstation itself, the

vendor said. NCS is made up of a series of components that perform two basic functions. One provides an environment that will allow applications to be dispersed and and the other provides tools that will allow users to create such

applicati The first major comp the Apollo system is the Remote Procedure Call Runtime Envi-ronment (RPCRE), which is responsible for packaging, sending and receiving, as well as error correction of the subroutines that will be processed across the network. This software, part of the source code that Apo lo will offer, must reside on each net-

k node that is participating in

The second component is called the Location Broker, which is actually part of the RPCRE. It can be thought of as a data b tion of the runtime envi ght of as a data base por in which information on the sys-tem's nodes is stored. The Loca tion Broker is responsible for coordinating the remote processing. By monitoring the network activity, it can at cessing task to the most suit

able system while an application For example, there may be

two large DEC VAX systems on a network ITH the Apolboth of which lo system, usare capable of ers can optimize the computing simulation apresources on a net-However,

the time the user is running his application. VAXs is being used by other en gineers. The Location Broke will alert the second VAX for the

The third major com consists of the tools a user will need to write applications for the system. The first tool is a highlevel language introduced by Apollo last week called the Net-work Interface Definition Language, which the vendor said supports either C- or Pascal-like syntax. Secondly, there is a new npiler, called the Network In face Definition Compiler

which will compile the new lan uage into C source code that m run on the NCS nodes.

Apollo's scheduled th

Apollo'a scheduled third-quarter product release will in-cluding the following: the Net-work Interface Definition Compiler priced at \$1,000 per node or \$8,500 per nite; the Net-work Interface Definition Language Source Code at \$25,000 for non-Unix and non-VMS systems; the Network Computing System Unix Runtime Source System Unix Runtime source Code at \$1,000; the Network Computing System VAX/VMS Source Code at \$1,000; the Network Computing Architecture Public Specification priced at \$80; and the Apollo-specific Network Computing System Docu

### DEC low end free 2000 model o

	Disbless monochrome Vazstation 2000	Disk-based monockrome Vasstation 2000	Fully configured disk-based monochrome Vaxitation 2000	Entre-level	Diskless Microvax 2000	Fully configured Microsox 2000
Users	1	1	1	1-4	1-4	1-4
Memory (bytes)	4M or 6M	4M or 6M	6M	4M or 6M	6M	4Mor6M
Expanded Storage (bytes)	-	42M disk drive 1.2M floppy drive	71M disk drive 95M streaming tape drive	42M disk drive 1.2M floppy drive	-	71M dink drive 95M streaming tape drive
Price	\$10,500	\$13,150	\$22,245	\$11,100	\$12,900	\$18,195
Price with additional memory	\$12,500	\$15,150	-	\$13,100	-	\$20,196

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no wonder they sometimes seem out of control. But before you send for the stratijacket, try a more proven approach—pick up the phone. And call for VMCENTER.

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# IBM bears brunt of drop in its mid-range sales

BY CLINTON WILDER
CH STATE

ARMONK, N.Y. — IBM's 27%

profit decline in 1986 was mainly stributable, to sharply lowes U.S. sales of microcomputers, mid-range systems and perpherals, according to detailed year-end financial statements obtained by Computersorial last

The statements, which will be included in IBM's forthcoming annual report, showed that U.S. revenue in both the perspherals and office systems and workstawns office systems and workstawns felt to \$4.66 billion from \$6.14 billion in 1985, while U.S. perspherals sales declined from \$7.31 billion to \$5.57 billion.

Despite what IBM called "substantial growth" in largeprocessor revenue as it ramped up shipments of the 3990 series, revenue from the segment labeled processors decreased 5% in the U.S. to \$3.5 billion. The segment had declined by 9% in the U.S. for 1985, because the 3990 product cycle did not begin until the fourth quarter of that

In 1986, IBM indicated, it took the brunt of lower sales in the beleaguered mid-range. Lower mid-range revenue brought the entire category into negative growth in the U.S. and reduced worldwide processor

The office systems segment includes all IBM Personal Computers, includes all IBM Personal Computers, includes all IBM Personal Computers and typewriters. The 24% drop provided dramatic evidence of the pricing pressure, increased competition and slower demanded besieveing IBM in the U.S. micrò

The office systems segment's revenue declined by 10% worldwide, as international sales in all segments benefited from the decline of the U.S. dollar.

IBM estimated that its corporate net income of \$4.79 billion

rate net sncome of \$4.79 billon would have been lessened by 13% without the favorable currency changes. Peripherals include terminals, printers, copiers, storage devices and telecommunications

devices and telecommunications products. The segment's 24% drop in the U.S. followed a 6% rise in 1965. Peripherals sales were down 11% worldwide, to \$11.26 billion. IBM's revenue from the soft-

nts were both up 9% in the

m 0.5.m1986.

# SAS aiming at business world Socks to tie SAS System to mainframe DBMS, low-end VAXs

Seeks to tie SAS System to mainframe DBMS, low-end VAZ

DALLAS — The SAS Institute in making a concerted effort to the its well-known statistical, graphics and reporting SAS System to mainframe data bases and the low end of the Divisial Eouin-

ment Corp. VAX line.

Recent moves by the compony indicate it is seeking to move
of beyond its reputation as a supplied er of graphics and statistical
analysis software — the name
of SAS stems from statistical analysis

analysis software — the name SA stems from statistical analysis software derived from research at the University of North Carolina — and working to tie into key products serving the corporate business world. On the same day as DEC's am-

nouncement of its low-end Vasstation 2000 last week, SAS officials told attendees at its users group conference in Dallas (see story page 23) that a version of the SAS System will be available to run on the DEC workstation by this year's second quarter. The Cary, N.C., software company is also producing an interface to IBM's DBZ that is exterface to IBM's DBZ that is ex-

company is also producing an interface to IBM's DBZ that is expected to be introduced sometime in May or June. The menu-driven interface will generate SQL statements that query DBZ and provide data for use in SAS applications. SAS users will also be able to optake DB2 complete sprund consultability. Through the interface. No price has been ext, applicamen said. Let in 1897, 505. Will amount as interface to Gallette to California of the California o

spokesmen said. No pricing has been announced.

In addition, SAS Institute President Jim Goodneght said his company wants to be a competitor in the data base management field with the relational product it acquired from Intel Corp. two years ago, the System 2000.

it acquired front unet scorp, every pursurage, the System 2000.

The data base product retails fore \$10,000 to \$12,000, officials axid. Goodnight acknowledged, however, that the installed base of the product remains small, at shout 500 units.

Conversion on terger
In addition, Conduight reported that the process of redsguinging the SAS'system and converting it also the C
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not expected to be completed before early 1989. Goodsight said SAS Institute engineers and best-test sites: SAS System data libraries. Liengineers and best-test sites: SAS System data libraries. Limill probably test Version 6 somer than any product we have shopped. We will have to have

have a single system we can move forward very rapidly,"

Goodnight said.
The SAS System ran exclusively on IBM mainframes until the fall of 1984, when the first

# Cray courts Fortune 500 with downsized \$2.5 million X-MP

BY JEAN S. BOZMAN

MINNEAPOLIS — Cray Research, Inc. opened the door last week to a new class of users for its supercomputing systems — commercial enterprises in the Fortune 500. A downsized version of the X-MP series has lowered the price of entry to Cray supercomputing to \$2.5 million. The X-MP/14SE is the slow-

super-computing to 2.5 mission. The X-MP/14SE is the slowest X-MP model available, performing 275 million floatingpoint operations per second (MFLOPS)—about one quarter the power of an X-MP/4 — for a fraction of the X-MP's average \$14 million price.

The amouncement of the entry-level X-MP was accompanied by the introduction of three other models — the \$8.5 million X-MP/116, the \$14.5 million Cray-2/4 and the \$12.5 million Cray-2/2. However, the X-MP/14SE units will be the only Cray machines that cannot be upgrad-

ed to higher models.

Cray's X-MP product line
now ranges from the \$2.5 million
X-MP/145E, a single processor
with 32M bytes of memory, to
the high-end X-MP/416, a

128M-byte, four-processor unit priced at \$16 million. The Cray-2 line new has three models, acluding the 16-byte, two-processor 2/2, the 16-byte 2/4-256.

There are now 11 X-MP models, excluding two older one-processor models that were with-drawn from the market this week, the X-MP 11 and the X-MP 11

cessor models that were withdrawn from the market this week, the X-MP 11 and the X-MP 12. There were also three price reductions in the Cray Intup: the top-of-the-line Cray Int-1256 was reduced from \$17.6 million to \$17 million, the X-MP 24 from \$8 million to \$7.5 million and the X-MP 22 from \$7 million

The wider array of products expected to frave new and result business for Cray, which generated \$596 million in revenue and \$125 million is profits last year. Urela now. Cray had only about 100 users around the world and only 150 machines installed. Most customers are U.S. government agencies, oil companies and foreign governments. Production has been steady but limited outcome the set steady but limited to the control of the control of the companies and foreign governments. Production has been steady but limited to the control of the contr

ited, with just 35 X-MPs produced last year. The intent in introducing so

## Latest Cray Research supercomputers

Market	COTO	Money	Actions	Quit Time	Air college
2/4-128	4	1G byte	2GFLOPS*	4,1 nsec	\$14.5
S/2-13E	00	15 hyte	<b>ACTIONS</b>	4.Timer	su
X-MP/116	1	12AM bytes	1GFLOPS	8.5 mec	\$8.5
S-MP/1440	1	SEN	armer LOPS	24.8 max**	48.5

many models over a wide range of performance is to widen Cray's user base. "Instead of the supercomputer market matuing, we see that it continues to expend," asid Robert Ewald, vice-president of commercial marketing at Cray.

Users eagerly waiting
Users seem to be eagerly awaiting the delivery of the entry-level X-MPs in the third quarter of this year, slong with the other new machines. "There was always a large gap between the highest level [Digital Equipment Cray," WASs and the smallest Cray," waid Peter Patton, director of the University of Mancesone or of the University of Mancesone

ta Supercomputer Instit which operates a Cray 2. Now, Patton said, users cial companies may find that the low-end X-MP price tags, ranging from \$2.5 million to \$7 million, are not terribly higher than IBM's.

Industry analysts were also pleased by the move. "This will open up more alset from cost conscious customers," said Michael Crask, an analyst with Son Francisco investment branking firm Robertson, Colman & Stephens. He projected Cray revenue at \$750 million for this year.

— with even greater revenue possible at time goes on.

The revumped lineary of Cray accesses a second of Cray and the control of the cont

mae at 3/50 mission for furs year — with even greater revenue possible as time goes on. The revamped fineup of Cray machines offers a wide range of performance. The low-end X-MP 145E will run at 275 MFLOPS, Rwald said, while the high-end X-MP offer slightly more than 1 billion FLOPS, and the Cray 2 offers about 2 billion be Cray 2 offers about 2 billion

FLOPS. Those numbers are the oretical maximums, and actual performance will vary by application, Ewald said.

Cycle time for the new machines will not differ from that of previous Cray 2 and X-MP modela, with the exception of the X-MP 14SE. That unit will run about 75% slower than the 8.5nsec cycle time of other X-MPs. Cray 2 models will run at 4.1

Cray 2 mooes was rue es v.e. nec, Cray spokenmen said. Another new feature, called the HSX high-speed external channel, will now be available for all Cray systems. This external channel will link Cray supercomputers who other Cray computers, peripheral devices or computers made by other vendors. Running at 100M bytefrect, the HSX channel will operate at dis-

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# Novell policy shift seen paring dealers in favor of direct sales

OREM, Utah - Dramatic changes in No vell, Inc.'s distribution policies could re-sult in lower prices and an initial drop in support for users of the company's net-

orks, distributors predict.
Novell has asked its distributors to sign contracts stipulating software quotas be tween \$1 million and \$3 million. Distribu tors also are required to purchase 10%, or \$100,000 to \$300,000, of the agreed-

They want to sell a lot of their softobserved one distributor, who added, "The more software you take up

The up-front purchases could lead to a shakeout among Novell distributors, forcing as many as half to drop the product, several distributors predicted. Distributors said they believe the

strategy will require some users to obtain support-only contracts with the remaining Novell partners, while others will buy products directly from the company.
"I absolutely think Novell will start

selling direct [to users] in a major way," said Ian Ebel, president of Microserv Technologies Corp. a Novell distributor based in Boston. He said some of his deal-

and orders in that direction. Repeated efforts to obtain commen

om Novell were unsuccessful.

In addition, distributors claimed the resirement to purchase large amounts of software up front is some to incite a price

war, if not lead to the availability of Noveil's Netware network software through "Distributors are sure to find a home for that software. It's too much software

for time software, it is too much software (to take on at one time) to be nice guys about it." said Terry Green, president of CPU Corp., a Novell distributor in Hous-ton, and president of the LAN Group, a consortium of five Novell distributors. The excess software could resurface in the gray market, which is typically fed by distributors and dealers who have more ed site license was enough to lure J. C.

products than they can sell or afford to Novell's products require a lot of suport, according to Ebel. Tin not sure that Novell has the sup-

ert network in place to support all these customers. There's a chance that the whole thing could backfire in a very bad way for Novell," Ebel said. "We have tried to convince Novell that they need the whole support organization out

# Sprint word processor adopts others

SCOTTS VALLEY, Calif. - Borland International, Inc. last week announced a word processing program that allows the user to configure almost all operating commands and can emulate those of other

odors' word processors. A user could create a document under one word processing program's com-mands and read it under another using an automatic file-conversion command, ac-

The product, Sprint: The Word Pro-cessor, reportedly will be able to emulate file structures and respond to commands

pro International Corp., Word Perfect Corp., XYQuest, Inc. and Ashton-Tate, according to Borland.

Business-user appeal Borland sims to appeal to business users who may have several word processing ograms in use in a single office The writers may sometimes need to are documents but resist switching

from the word processing programs with which they are familiar. Sprint: The Word Processor costs \$195 and is scheduled for release in the

# J. C. Penney lured to Supercalc4

BY DOUGLAS BARNEY NEW YORK - The appeal of an unlimit

Penney Co. from Lotus Development Corp.'s 1-2-3 to Computer Associates International, Inc.'s Supercalc4.
"The key reason was the price and the fact that we are used to centralized con-trol," said Hal Menzel, senior technical specialist for J. C. Penney in Dallas. The agreement allows J. C. Penney to central-

ly acquire and distribute Supercalc4 There are also some nice features in the product, according to Menuel.

The licensing agreement allows for an

unlimited number of copies to be used by J. C. Penney, and the bulk of new spread-sheet users are expected to use Super-calc4. J. C. Penney's DP department paid for the license and mai ment and will charge users \$39 for a com te package. "I suspect most people are

oing to be ordering (Supercalc4) rather han getting Lotus," Mennel said. J. C. Penney had nearly standardized on 1-2-3 and had developed a set of 18 tivity and control costs. Those macros are now being converted to run on Supercalc4. Supercalc4 also reads and writes Lotus 1-2-3 files

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### cally delivering arrays of hundreds, even thousands, of records at a time. □ REASON #3: PARALLEL-

PROCESSING OPTIMIZES COMPUTER RESOURCE USAGE. V5 is 100% re-entrant shared code, and

V5 is 100% re-entrant shared code, and ORACLE's parallel-processing architecture fully exploits modern dyadic and quadratic processors from IBM, and other multi-processing computers such as those from DEC and Stratus. So ORACLE uses all the MIPS in parallel-processor

☐ REASON #4: MULTI-TABLE CLUSTERING OPTIMIZES JOINS. ORACLE stores data from different tables on the same physical disk page. This technique—called multi table clustering—permits you to access data from multiple tables in one disk read operation. Clustering improves ORACLE performance on all multi-table operations, such as join queries, update transactions, etc.

REASON #5: HIGH-SPEED RELATIONAL SORT FACILITY OPTIMIZES DATA AGGREGATION

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# Teradata ties LANs into machine

BY CHARLES BABCOCK LOS ANGELES — Teradata Corp. is offering the Communi-cation Processor, said to the Eth-ernet or other local-area net-

The LAN tie-in is both a hard-ware and software addition to the data base machine that allows end users direct access to the large corporate data bases typically stored on it. The Com-munication Processor will work with any LAN that conforms to

(TCP/IP) or International Stannetwork protocols. Teradata of

Software that man

workstation session on the DBC 1012 is available for the IBN Personal Computer or co bles or an AT&T 3B2 min

By using an SQL-based re- un-terface such as the Portable PC/ SQL-Link from Micro Decision-ware, Inc. in Boulder, Colo., an end user may formulate SQL queries transmitted over an Eth-

man.

S. Boyd Pearce Jr., Teradata vice-president of marketing, said the Communication Processor on the data base machine has a maximum of 64 concurrent us-

sor and software is available im-mediately at a price of \$39,000 with an additional \$4,000 price with an additional \$4,000 price on TCP/IP or ISO/OSI adapter A PC interface license for 10 PCs is \$5,000, with a 3B2 interface priced at \$2,000, the spokesmen

# Lotus to jazz up Mac debut

BY DOUGLAS BARNEY

CAMBRIDGE, Mass. - De CAMBRIDGE, Mass. — De-spite disappointing sales of Jazz, an integrated package for Apple Computer, Inc. a Macintosh, Lo-tus Development Corp. is set to re-enter the Macintosh market

with an announcement March 3.

The release, expected to coincide with Apple's announcement of two new Macintowhes, is mens or two new manuscribbles, is essentially a new version of Jazz containing five enhanced mod-ules: data base, spreadsheet, word processing, graphics and communications, sources say, it is unclear whether the product

will be named Jazz.

In one of the most impor ncements, the spreadshee odule will be more closely gned with Lotus's 1-2-3, a ce close to the compa aid. One of the shortcom Jazz has been the lack of macr and Lotus lost market share Microsoft Corp.'s Excel.

The new Jazz is expected to include the 1-2-3 macro language and will read and write 1-2-3 .WKS files. The package is expected to be marketed along with the existing Jazz, not be a replacement for it.

Lotus's success again Lotus's success against Excel with the new strategy depends upon the offering's quality, one user says. "There would have to be sufficient improvement to cause us to displace Excel," says





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# Module sets aside memory

Unisys claims 40% power gain for A 12s, A 15s using cache

BY JAMES CONNOLLY DETROIT — Promising performance gains averaging 40%, Unitys Corp. last week announced a software disk-caching fact for users of the company's largest

The Software Disk Cache Module sets aside portions of main memory in Unisys A 12 and A 15 mainframes as dynamically illocable cache. The approach by Unisys allocator cacoe. The approach by Conditions from how some other vendors manage cache, which is on disk controllers. The advantage to the Unisys approach is that the Software Disk Cache Module allows users to move data from various disk strings into a single cache, ac-cording to William Maclean, Unisys pro-

gram manager for system software.

Maclean said the greatest perfor-

mance gains, were achieved by using the Software Disk Cache Module in I/O intensive applications, particularly applications in which data bases are not managed by Unisys's Data Management System 2 (DMS2). He said DMS2's buffers provide

The module, which requires Unisys MCP/AS Release 3.6.4, uses a minimum

of 24M bytes of memory on the A 12 and 48M bytes of memory on the A 15. Mac-lean said approximately 170M bytes of the 192M bytes of maximum memory in the A 15 can be set aside for cache

Available now, the module on an A 12 costs \$5,280 per month on a monthly liconse or \$258,720 for a five-year, extend-ded-term purchase. The cost for am A 15 is \$6,360 per month or \$311,640 for a five-

# Intel soups up 80386 family

SANTA CLARA, Calif. - Intel Corp. will this week introduce a series of 80386-related chips it says will lead to faster, small-er and more efficient systems. The chips include a 20-MHz version of the 80386 microprocessor [CW, Feb. 2], two peripheral chips and a numerics coprocessor that was originally announced in October

According to Intel, the new micro processor operates at between 4 and 5 processor operators at network 4 and 5 million instructions per second, which is 25% faster than the 16-MHz version. This rating also puts the new 80386 ahead of Digital Equipment Corp.'s VAX 8600 and IBM's 4381 in terms of raw

Dave House, Intel Microcomputer Group vice-president and general manag-er, said that the immediate impact of the new chips will be seen in performance-mental areas such as computer-aided de-

sign, manufacturing and engin departmental-level computing. partmental-level computing. The peripheral chips include an inte-

grated-system peripheral that includes di-rect-memory access as well as major pro-cessor support functions and the 82385 The 80387 will perform floating-point

operations for math-intensive applica-tions. With the new 80386, 80387 and pe-ripheral chips working together, the "full potential of 80386-based systems can w be realized," House claimed. Because the 82380 Integrated System

Peripheral eliminates the need for as many as 30 large-scale integration and very large-scale integration components in most applications, the chip reportedly design time and board space. The 20-MHz 80386, the 82380 and the 80387 are available now. Intel said it will ship the 82385 in the second half of

# Operating system for 80386 lets users access existing applications, MS-DOS

BY DAVID BRIGHT

MONTEREY, Calif. — Digital Research, Inc. amounced last week that it had tai-lored its IBM Personal Computer AT-based Concurrent DOS Expanded Memory operating system to systems based on the Intel Corp. 80386. Called Concurrent DOS 386, the new

cerating system is aimed primarily at ultiuser environments that need to si-ultaneously run existing Microsoft orp. MS-DOS applications packages. Corp. MS-DOS applications packages. The operating system also runs Digital Research's CP/M-86 operating system. Digital Research will initially sell Con-current DOS 386 to OEMs and then move

it into retail channels around May, accord ing to Frank Iveson, sales director. Digital Research has already signed up two OEMs in the UK — Jarogate Ltd. and Comart Ltd. - he added.

The operating system uses the chip'a Virtual 86 mode to run multiple 16-bit programs in separate 1M-byte sections of memory. While Concurrent DOS 386 sup-ports the chip's 32-bit native mode and its 4G-byte address space. Digital Research will instead emphasize the operating sys-tem's multitaching capability for current senderations. Disconserved. applications, Iveson said.

the buge base of MS-DOS packages as well as the 1,400 vertical-market and neral applications already available orldwide under previous versions of occurrent DOS, Iveson added.

The operating system is expected to be available in early March. Digital Research recently introduced the Flexos 386 operating system for in-dustrial real-time environments using 80386- and Intel Multibus II-based sysns (see story page 49).

"According to users, SYSTEM/MANAGER is more cost-efficient, is easier to use, and provides more features and options than the CAI and Tower products."

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# Honeywell reports first deficit ever — \$492M

BY CLINTON WILDER

MINNEAPOLIS — Honeywell, Inc.'s fi-nal year in the computer business was a disastrous one as the company last week ted a net loss of \$492.8 million, or

ne charges and write-downs.
In addition, Honeywell noted that its only remaining computer operation, the Federal Systems Division, will turn over 50% of its profits to the new joint venture formed by Honeywell's Information Systems Division, Japan's NEC Corp. and France's Compagnie des Machines Bull.

The profit sharing plan has been nego-ated among the three companies since the Dec. 2 announcement of the joint ven-

"I'm not sure why they decided to do it that way for accounting purposes," said Gary Blauer, analyst with Minneapolis-based Dain Bosworth, Inc. "Federal Systems will be buying a lot of product from the new venture, so it could just as easily

the new venture, so it could just as easily have been put into prices. The new ven-ture sees the division as a customer, and they are going to need customers." When the new computer venture was nounced, Honeywell said it was retaining U.S. ownership of the Federal Sys-tems unit because most federal computer contracts are closed to non-U.S. vendors. The final structure of the vet-unn venture is expected to be announced next

Among largest losses over Honeywell's loss, its first in 60 years as a public company, ranks among the largest deficits ever reported by major computer vendors. Control Data Corp., in the midst of its fiscal crisis, reported a 1985 loss of \$567.5 million, or \$14.56 per share. Honeywell took most of its major

FINALLY,

charges in the fourth quarter, including the \$408 million, \$9.04 per-share loss from the sale of 57.5% of Information Systems to the new venture. Honey sold the operation for \$250 million b ture. Honeywell

book value The company did not break out 1986 results for the information systems unit. since it is now accounted for as a dir tinued operation. A spokeswoman said the computer division was profitable, excluding one-time charges, but the unit's profit was expected to fall significantly

proof was expected to fall significantly from its 1965 level of \$200 million. Dain Bosworth had estimated the divi-sion would earn just \$90 million in 1986 [CW, Dec. 8]. In overall corporate results, is

from continuing operations, excluding charges, fell 14% from \$220 million, or \$4.80 per share, in 1985 to \$189 million. Charges of \$134 million for consolidations Charges of \$134 milion for cossolidations and job reductions and \$42 milion for inventory write-down reduced Honeywell's actual 1986 operating income to \$13 milion, or 28 cents per share.

Honeywell Chairman Edson Spencer said the company's first-quarter 1987 profits would be flat compared with those of the ways.

of the year-earlier quarter but that net in-come would improve substantially during the rest of the year.

"It is now a whole different company with a new industry mix," Blauer said. "I think they will meet their targets, altrans they will meet their targets, sa-though their results are now more tied to capital spending growth than before. For the year, Honeywell's overall cor-porate revenue grew 8%, to \$5.37 billion, from \$4.99 billion in 1985. Fourth-quar-

# ter revenue was also up 8%, from \$1.50 billion a year earlier to \$1.62 billion. DPS 90 line gets 10% price slash

BY JAMES CONNOLLY

PHOENIX — Honeywell, Inc. has cut prices on its DPS 90 mainframes by an av-erage of 10%, a move the company said is intended to make Honeywell'a largest systems more competitive with the IBM

systems more comp stems more competitive with the 10st 90 mainframe family. The announcement came after IBM restructured and enhanced the 3090 line to improve price/performance ratios and af-ter Honeywell officials reported that they expect to use recently introduced NEC Corp. processors in the DPS 90's succes-

The DPS 90 itself uses technology de-veloped by NEC, which this month an

nounced systems providing twice the per-formance of existing NEC systems.

All five models of the DPS 90 family are affected by the cuts.

The price of the uniprocessor DPS 90 91 was cut from \$3.95 million to \$3.55 million. The dual-processor DPS 90/92 was reduced from \$5 million to \$4.5 miland the redundant dual-process DPS 90/92T was cut from \$6.25 million to \$5.625 million. The three-CPU DPS 90/93 was reduced from \$7.3 million to \$6.5 million, and the four-CPU DPS 90/ 94 was cut from \$8,35 million to \$7.6 mil-

Monthly maintenance prices were also reduced. For example, the maintenance charge for the DPS 90/91 was cut from \$6,250 to \$5,625.



"If you're looking to establish a corporate-wide standard for communications, look at RELAY Gold." PC Magazine, Oct 28,1986

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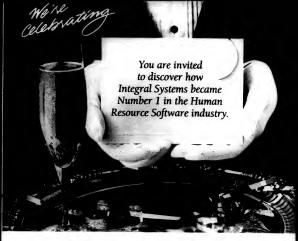
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interface for programmers who want to inclicommunications in their applications. Call today. Join the more than 200 cor-porate sites that are already effectively using The RELAY Family.

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### **EDITORIAL**

# Cloudy Blue skies

BM HAS CHOSEN an unusual time to declare 1987 "The Year of the Customer." At an Orlando, Fla., gala for 150 of its big-

gest users two weeks ago, IBM brought out its top executives to kick off the new campaign with three days of back-slapping, cheek ago and whispering about future product plans. The message was simple: IBM cares about its customers and wants to histen.

Yet only a week before the Florida confals, a very different flat gave its valued mainframeusers a message that was shrouded in vagaries and into on detail. The occasion was the announcement amendation of the control of the standard control of the control of th

Solutile servance concepts you for the confusion is IBM's doing. When it unvalied the E series, the company told its current valied the E series, the company told its current valied to the EMP of the Confusion of the EMP of the E

are not autowen.

IBM was also evasive about what is really new in the E machines. Customers were told they will get a 3090 E immediately if they have a 3090 or order. But users who have already taken delivery of a 3090 — even if it was only last week — must pay the full upgrade price.

IBM STATEMENTS SINCE the amouncement have only further clouded the jecture. The E models that will ship this month aren't full-function versions of the new machines, IBM said. Those will be upgraded in May. And an IBM spokesman admitted to a Computersworld reporter a week after the 3090E's debut that an upgrade within the same model is "technically possible," but that IBM won't help the customer doi.

IBM has long labored under the image that it exists only to sell more "from." But in a market that is being driven by an increasingly shrewd breed of user and squeezed by some hungry competitors, it is in IBM's interest to shed that stigma as soon as possible. The more cynical IBM critics have already written off the 3090E as an IBM ploy to boost its bottom line at the expense of its customers. What's troubling is that some of those critics are customers themselves.

IBM owes its customers a clear and continuous statement of product direction, the kind that won't let them make expensive and embarrasing buying decisions. Users owe IBM an equally open response when the vendor's activities don't agree with them. The Year of the Customer is dawning, and it promises to be a pivotal one for both.



### LETTERS TO THE EDITOR

# Lucid documentation

Something important is missing in your article. "Intrapreneur-ship: Turning in-house projects to profit" (CW, Jan. 19). Customers need and expect better documentation than in-house users do.

In-house users have probably

to-nouse users nave protestory seem the package develop. They also have easier access to technical support than do commercial users. So commercial documentation needs to be simpler and more thorouse users. In addition, commercial users expect more graphics and better pack-

aging.
Good documentation belps
self software by convincing potential commercial customers
that their people can use the
product. But good documentation requires careful planning
and development — and that
means time and money.
Last-minute documentation
is often insucurate, incomplete

and poorly written; it may even make the package more difficult to sell. Norman Boyer, Ph.D.

# Sandra Pakin & Associates Chicago PCTs and VDTs

Your article on display terminals.
"VDTs: Doing more for less."
[CW, Jan. 19], did your readers a
disservice by not covering personal computer terminals.
Don't just take my word for it,
because I'm sure market researchers at Dataquest, Inc. and

International Data Corp. would both agree. The PC terminal market grew at a faster rate than any other ASCII terminal segment. So much so that companies like ADDS, Ampex Corp., C. Itch Electronics, Inc., Falco Data Products, Inc., Liberty Electronics Co., Televideo Systems, Inc.. Visual Technology, Inc. and Wyse Technology, Inc. have chosen to enter it.

Yet your story did not contain a single syllable about what a

personal computer is, what makes a terminal a PC terminal or what the PC terminals market is all about.

Robert A. David

Director of Marketing Kimtron Corp. San Jose, Calif.

# This week in history

Feb. 21, 1977
A U.S. District Court judge decides to abort the California Computer Products, Inc. vs. IBM antitrust trial after three months of evidence against

The move leaves members of the dismissed jury frustrated and disappointed at not being able to see the case to completion since, before hearing IBM's defense, the majority of jurors leaned toward Calcomp.

Feb. 22, 1982 A Hollywood movie producer looks for used computers for "War Games," scheduled for release in 1983.

The United Artists' feature film's associate producer explains that banks of the hardware are needed in order to make the computer-room set look authentisc. Addressing Sec. 1706

Thank you for your editorial, "Declaration of independents" [CW, Jan. 19], on the impact of Section 1706 of the tax reform package on independent contractors.

I would offer that any reader who wishes to contact members of Congress regarding Section 1706 to please write Dean Gallo (R-N\_J) of the Small Business Committee, Minority Enterprise Subcommittee, and Robert A. Roe (D-N\_J), of the Science and Technology Subcommittee, in

Congress of the United States House of Representatives Washington, D.C. 20515

### George Moras Kinneton, N.J One hundred flowers

I enjoyed the Executive Report, "Parallel Processing" [CW, Dec. 22], very much. It was gratifying to see there is support for the coexistence of a great many approaches to super computing. The old proverb, "Let a hundred flowers bloom," should not be attributed to Mao Tae-Tung.

be attributed to Mao Tse-Tung. He appropriated it, adding the words.".. then pick them all at once." He was referring to his policy of encouraging dissent and pluralism for a few years, in order to bring those so inclined into the open; thus was always followed by a ruthless purge.

I hope of the "hundred flow-

ers" of superspeed computer architecture many bear fruit. Problems exist at many levels of granularity, and some primarily recursive algorithms cannot be parallelized at all. Larry Van Stone

Conoco Inc. Ponca City, Okla

# PC or paperweight? The boss goes off-line

for a pipeline to the front office. Get The Big Guy on a PC. Teach him Lotus, teach him data base management. Make him an Info

Age swami and he'll be eternally

grateful when budget time rolls

away and shake their heads when I nassed through that afternoon

Doom, is why. No win, is why Mr. Techvoid is on the throne

news that the 20th century is

So I sent Beason, then Port-noy and then Johnson. Three strikes. Myturntobat.

strikes, Myturn to bat.
When I peered around the corner of his door, I shaddered a bit and involuntarily sunk backward. "Now, now, Mr. Barnes. He doesn't bite," his executive

assistant urged, nudging me to-ward the office. "What's the

natter with you techie types

drummed the top of her v

She had been in the IC a year ago screaming loudly about how

centralized mode of operation. Anyone who installed their first

had little choice. (Remote batch

ith a single system.

tem more than 10 years ago

ogy stinks and where was



lohoson was the third guy to return from the executive suite disfigured. He looked at me in em barrassment, his e twisted into that frozen mix ice and a smile of pa-

Three hours was the record. Benson and Portney had each come back after two hours with that same bigarre contor-tion on their faces. Frankly, I was angry with the failure of the first ut when I saw poor Johnson, I knew we were all in for a long siege. I sent him home and looked grimly upward toward the 25th floor.

The moment of truth, in fact, had come when they told me to head up the information center. Great, I thought, terrific. Lines of neophytes looking to me to ed them to the promised land. PC literacy spreads throughout the land on the wings of my every nod and comment. Grateful end rs singing hosannas to the de-tment chiefs about that wonderful guy at the IC, the guy who

ve them The Power. But eyeo then I knew the call would come. It might be some executive assistant bucking for a promotion, but more likely the Head Honcho in MIS was looking

essor. I rem

# Why the sky is not falling

My theses are very different from those of the mosners and groaners in Silicon Valley. I be-

The computer business is flourishing worldwide. The U.S. is far out in front of its rival, Japan, and will stay in front for at least 20 years.

Chip-making is in great shape

around.

And who would they send to get Mr. Top Gun loaded? You got it. Let the info center do it. Aren't they responsible for end users and PCs? No problem. But here and in Japan.
• Federal assistance, stance in the funding of the construction of a chip superfoundry, why was the MIS guy snickering when he left my office? And why is not needed

· Protagon intervention on the of security is contra-in-

• The loudness of the cnes for money or protection is in propor-tion to the greed and/or incomand you get to bring him the

ence of the petiti Growth around the world, in either financial terms or nu of users, is between 10% and 15%, the exact figure depending on how you handle the homecomputer part of the desktop ness and, in the U.S., on how handle military hardware and software. This figure com

res with the historical rate on the mid-1950s to the early 1980s of 15% to 17%. These figures reflect the rate at which el technology can be absorbed once pent-up initial de-

Do you suppose the shipbuild-ing, steelmaking and auto industries would complain if they had such a growth rate? If it continer education in working with in-

rantee, our industry and its ancillaries will be the largest sec-tor of both the U.S. and the inter-

nstional economies in a decade.
The sky is not falling. Then
why does the press tell us it is?
Two answers: The nicer one is that journalists are new to the e, having been charged up at game, having been cnarged up the beginning of the person computer boom. They growth of less than 40% or 50% a year unexciting. One piece of evidence is the silly dispropor-

terminals and data entry sys-tems don't count.) Anyone whose first system is more recent must have started small tion of attention to the smallest machines. To such people, ma realizes that (a) many of its bus ed, jargon-ridden and boring. The other answer is that sto-ries that the sky is falling are ex-citing, are read closely and sell oublications.

réalités unu (2) many or un une-neas functions are inherently dis-tributed; (b) local managers should be allowed to managers and (c) technology permits com-puting to follow the business. Ev-eryon starts talking about the dangers of putting all your eggs in one busket. The conclusion is The key to continuing Am nance is research. Until the Japanese remodel their extremely good but ngid educastributed processing. Proces-rs are purchased, lines are

Grouch is known for the relationship tween computer speed and cost (Grouch's Law), which he discovered a the early 1950s. He has worked for IRM neral Electric Co. and the lederal

in Europe, North America

employer support of that system is changed, there will be a major shortfall in the production of research men (and especially wom en). It isn't a question of ability. The great outfits like Fujitsu Ltd. and even the universities vizorously working for

Yes, the Japanese beat us to each generation of memory chips. That takes development skills, exquisite manufacturing care and long-term investment

of deep concern to the Pents gon, and deplored the acquisition Fairchild Semiconductor Corp. by Funtsu. I wryly noted that he did not mention that the inframes offered by ICL PLC, Stemens AG, Honeywell Inc., BASF Co. and Olivetti Corp. are all of Japanese design

nanufacture Note that the factories that Funtsu and NEC Corp. and Hitachi Ltd. and Toshiba Corp. might take over (or build) would be incated in the U.S. and staffed al-



of large quantities of money, all of which they have. We produce 80386 chips and such things as new microprocessors, reduced instruction set computing chips d hybrids. Both countries are

Do we want to get the lower priced random-access memory (RAM) production back? We could, with superb microrobotics and Class-One clean rooms and lots of money. With the same level of effort, we could get color TV production back. At bes both are dog-eat-dog, low-profit scrambles, and both the IIS and

agan would be well advised to newer markets. The well-publicised calls for a large federal investment in a su perfactory to make superchips in superquantities are not being challenged loudly enough. Congressmen, computer manufacturers and concerned citizens are all saying, Well, even if it isn't necessary, it will help the semiconductor companies compete against overseas outfits. That isn't what the chip makers rant the taxpayers' money for

They want a free superfactory with which to compete. IBM is already building a facil-ity in East Fishkill, N.Y., as advanced and considerably larger than the one proposed by the Seech consortium. And IBM is doing it without federal support. ig its own experts, who are

the best in the world. There was a fine story supporting the idea of federal interon by Bohdan Szuprowicz in the Dec. 8 issue of Computer ld. He emphasized the national security aspects, which

which is much more secure in a national emergency than the chap foundries U.S. firms have built in Europe or the Far East. And note that Toshiba, for instance, is furnishing its advanced dynamic RAM know-how to Mo-torola. Inc. as Fuitsu doubtless ans to furnish its technology to Fairchild. Our security is creased by interactions with To-

There is a dark side to Pentagon support, and that is the restriction on exchange of technology across national boundaries ing companies with different vels of military commitment and even between American enincers and scientists. This is the est danger to nat nty and America's worldwide domination of information tech nology - not Russian sores, not ese manufacturing skills. not low Korean wages, but the perennial military desire to build a wall up to the sky and molate our technical people from the rest of the world and each other I will not dwell on my sexth thesis, but simply restate it. Our

ustry is rife with greed barred, in most cases by investor demands, from long-term plan ning and investment and heavily populated with frightened and incompetent executives Propos to tap the federal, and especially the military, till should read with that in mind. American computers are

great. American chips are great American research and develop ment is great, ignore the screams from the weaklings and cowards and press on

# Change for change's sake

Balancing centralized us, distributed processing

EFREM MALLACH The Flying Wall das were one of the of all time. Yet ing acts that MIS m

e basancing acts that MIS men-ers perform every day.

MIS managers apend their wring lives balancing needs resources, maintenance vs. velopment, standardization flavibility software vs. people, overtime vs. schedule. From a strategic point of view, however, the most im-portant balancing act is probably rtant balancing act is prob it of centralization ---

used, programs are converted, as are split. Six months — or its own supermicro. Continued on page 18

three years - later, eve is distributed. Each war

# Paperweight 1 4 1

the door a bit too loudly behind me. The Big Cheese didn't look up for a long time. The AT, sitting precariously near the edge of his deak, looked like the monolith in 2001. I half expected him to start bang-ing bones on his desk and screeching.

He finally looked up at me and heaved a sigh of monsoon proportions. "Must we? said his face. "Sit down," said his mouth. The Big Guy hadn't arrived at where be was for nothing. The couch in front of his desk was several levels down from his eves and it was made of a material into which one sank like mucksand

chine has been on my desk for six months now and has yet to produce a meaningful blip of information," he said as he gently patted the cleanly dusted top of the AT stare at it each morning and urge it to duce something wort o justify its existence. But it simply stare back at me as if it were challenging me to produce something meaningful first."
"Cough, cough," I wrigale, "Hmmm

'Now really, Mr. Barnes. I have listened patiently to my MIS chief, and I endured the tribulations of your emissaries. And what I sense here is a gap

"A gap?" I reply.
"A gap, indeed," he bellows. "Do you now what I do virtually all day, Mr. what I do. I talk to pe

talk to them in person, I talk to them on the phone. I talk to them at lunch and dinner. I tell them what I want and they tell

me how they will get it for me "And then I receive this miracle of technology, this key to competitive ad vantage and I immediately sense a gap. It won't talk to me. It won't even is me, and it doesn't tell me how it will get what I want. You send me people who tell

me I must touch it and stroke it and make it feel wanted. And I say, let it make me feel wanted. I'm the Big Cheese, after "But sir," I interrupt with a sense of panic rising in my throat. "It's not that hard. We've customized a program for

simple commands. We've given you a hard disk so you needn't fuss with Soppies and

the communications pack-He is holding up his hand, ordering me to cease and des "I've been at this company for 30 years, Mr. Barnes. We are a very big com-

pany and we make lots of money. I use of that money to pay my accounting people to do the sprea sheets and when want information. I pick up my phone and call someone. You'd be amased at how quickly I get an answer I cleared my throat to respond, but he

continued. "Productivity, Mr. Barnes, is in the eyes of the beholder. I like your sounk, but call me when you've got some

you that gives you access to mainframe data and lets you do spreadsheets with hall I take it with me?" I asked. "Actually, oo. I don't want to appear to be fighting progress. And it makes a hell of

a paperweight. I slouch toward the door 'Oh, by the way, would you tell Ms Lewis to come in . . . to take a letter.

### Change FROM PAGE 17

up for central applications. We want to switch our Pittsburgh customers from the Harrisburg supply depot to the one in Ak-ron. Why did we ever split the distribution division into 16 kingdoms?

And so the Flying Wallendas' trapeze swings back. We install a central system to pull the supermicros together. We consolidate the data bases. We run more work at the central site. Soon the local micros

are reduced to intelligent data entry ma-chines. We're back where we were. Older but probably oo wiser.

Does this mean we should never decentralize? That we should always decen tralize? Of course not. What this means is that we must resist the normal human

temptation to deal with problems through change for change's sake. If a centralized MIS shop has problems, dis-tributing the processing will put problems in eight more places. If a distributed MIS shop has problems, centralizing will pub. them all on top of each other in one roo The organization's needs should be the ning factor in the issue of central ization vs. distribution. If you're in the

gasoline credit card authorization busi ness, 98% of your credit checks are for ople within 100 miles of their homes. Use regional processors and set up a net work for the other 2%. If you're in the na tional airline business, you need all your us in one place. Use a central avatem. It's that simple. Don't automatically do the opposite of what isn't working or the opposite of what your disgraced predecessor did. Just do what the business calls for. In shor

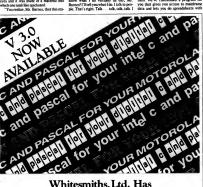
· Decide how information can best sup

port the business needs Set up your systems that way.
 Face any problems that come up within your system context, confident that your

sic approach is sound. Change your approach only if the business needs change or if the technology changes so drastically that earlier trade-

offs no longer apply.

Do this and you still may not live happi ever after. But you will lose that sinking Isn't this where I came in?" feeling you get each time the Wallendas' trapezo wings back to you.



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# SOFTWARE & SERVICES



Charles Babcock

Wanted: User

**SQL** input

Some critics are viewing the Structured Query Language standard recently published by the American National Stan-dards Institute (ANSI) as the

captive of vendors who supply SQL with their relational data

se products.
The fact that ANSI SQL so

sely resembles IBM's SQL rms to indicate to vendors

gave away the ballgame before

the first inning was over. After all, it is IBM that has failed to support use of foreign keys and

other extensions of the basic SELECT, PROJECT and JOIN

To follow IBM's examp To follow IBM's example in creating a standard is to hobble

the standard with IBM's expe

sible technically, critics would

That line of thought is not necessarily fair to the X3H2

committee, but Chris Date of

the Relational Institute has a point. I think, when he charges

the one that emerged from the

adard-setting process.

other critic, Sharor Weinberg, president of Codd & sulting, a sister firm of Continued on page 24

that the committee had a richer indard six months and than

olish what might be pos

that the ANSI X3H2 com

### BY CHARLES BABCOCK DALLAS - Customers of the

SAS Institute, Inc. applauded the company's effort last week to convert its product line into por-

table C versions and to supply more SAS software to personal computer users. But they questioned how quickly SAS would be able to im prove its mainframe product line, given its concentration on conversion to C-based code, and they urged the company to im-

prove the reporting capabilities of its mainframe base system. These and other reaction were evident at the 12th annual meeting of the SAS Users Group International held here last week. About 3,000 users attend-

At the opening session, SAS President Jim Goodnight told at-tendees that SAS development teams are in the process of coo-verting the base SAS System and

# Developing on DB2 reaps high returns

BY ALAN ALPER

NEW YORK - Despite DB2's inability to support referential integrity, data processing shops using the IBM relational data base management system should use it to develop new applications in hopes of achieving productivity gains and cost savings.

That was the recommenda-tion provided during a discussion sponsored by The Greater New York DB2 Users Group at the

# Users laud SAS portability move

data management, graphics and other applications into the Corogramming language.
The converted software has

en redesigned to separate the user-oriented application and supervisory layers from the operating system layer. The new architecture will allow future re-leases of the SAS System to be available on

PCs, minicomputers and mainframes si-multaneously, Goodnight said. SAS software is currently written in assembles

ducts are expected to ent beta testing early next year but will not be issued as products un-

David Wilson, a programmer analyst at New Mexico State University in Las Cruces, N.M.

be a boon to SAS System users 'It's a great way to en A programmer would be able to go from the mainframe to a PC, and his application would work on er ther one," he said.

Even though the current SAS product line looks much the same whether it is running on an IBM mainframe. Equip Corp. VAX or PC. environment has its idiosyncracies. There's enough dif-

Hermes Smith of the corporate management services group at CIBA-GEIGY Corp. in Greens-

borough, N.C., and president of the SAS Users Group Interna-Continued on page 25

# **Unify lifts** distributed **DP** systems Architecture matches

layers to processors

BY MITCH BETTS Unify Corp., a Unix software vendor based in Lake Oswego, Ore., recently announced a radically different architecture for

its application development and data base management software that splits the application into three layers running on micro. mini and mainframe processors. Unify's Cooperative Process-

ing Architecture breaks the application into three component - human interface processing applications processing and data base processing - and matches

each layer to the most appropri In an order-entry and sales tracking system, the data entry tasks would be handled by users at micros, the application would

be driven by the mid-range processor, and the data base would reside on a departmental main-frame such as IBM's 9370, Unify President Nicolas Nierenberg said in an interview. Primarily the architecture off-loads user interface functions from Unix minis to increasingly powerful PCs. be added.

The second layer, which re-Continued on page 24

Data View

Continued on page 25

 Kolinar undates its SOL/ DS tool. Page 26. . State of the Art adds ac-90 series. Page 28.



Spotlight

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# SQL input

the Relational Institute, told DB2 users in New York recently that the standard committee was dominated by SQL vendors who sat around eliminating SQL features that were not in their implementations. After all, the typical wedor might ask, What good is a standard if your productions.

uct doesn't meet it?
So what happened, in Weinberg's view, in that the vendors flocked to the X3H2 committee and voted down the features that they didn't have, leading to what Weinberg calls "a least common

denominator standard."
In talking with Donald R. Deutsch,
manager oldata systems at the General
Electric Information Services Co. and
chairman of the X3H2 commuttee, a picture emerges that isn't totally at odds

with Weinberg's view. "That's true. We have a least common denominator standard" reflecting current SQL implementations, be says. Furthermore, nembershap on the committee almost doubled during the last year as interested parties, including federal agencies but primarily SQL vendors, sought to participate in the stan-

dard-acting process, he says.

SQL, an IBM invention that has been around for a decade, came into its own last year with the widespread acceptance of relational technology. Deutsch correctly points out that the X3H2 committee is attempting to set an SQL standard swiftly on the heeks of that shemomenou.

### Cobol 85 browhaha One need only look at the brouhaha over

One need only look at the broundard over Cobol 85 to realize the hasards of setting a standard for a widely used product, even one supposedly already adhering to a standard. Deutsch cites the example of the Pascal standard, "which lagged years behand Pascal's acceptance."

"The effort bere was to get a standard out in front of the parade. Then we could place in the public domain the debate about SQL's extensions," Deutsch

This is an excellent point. By establishing a standard early, versions will consist the latest round of debate within the XME2 committee before heading off in their constitution with extensions. Even if multiple extensions do appear, the committee can highlight those that it is inclined to achiefe in the next version of the standard. Described says in addendum process has began to try capture the extension process and place it in the pubcreasions process and place it in the pub-

nic sorum.

Nick Rawlings, director of the technology department at Dun & Bradstreet Compating Services, points out another advantage of an early standard. It allows all vendors who wish to market SQL based products to share a common subset of the language, guaranteeing a kind of minimum transcontability of programs.

### 'IBM not under pressure' However, Rawlings says, SQL gets hurt if the standard-parting process is allowed

if the standard-setting process is allowed to sit for long in its present state, due to missing functions. In addition, "IBM isn't under as much pressure as it would be if we had a standard that incorporated features not in IBM's SQL," he notes.

If the vendors have won the first round by arguing for a least common denominator SQL, the SQL user communi-

# ty also won a round by creating a public process to further develop the language. Where are the representatives from the growing community of DB2 production worse who have the most effective in the community of the process

Where are the representatives from the growing community of B22 production users who have the greatest stake in extending the SQL standard If everyone is too busy implementing SQL application to joint the standard-setting process users will find themselves stuck with a limit of SQL that coast them efficiency for years to come. Some priority must be asset

users will find themselves stuck with a limited SQL that costs them efficiency for years to come. Some priority must be assigned, making users' needs paramount to the committee.

Or, as Weinberg told the DB2 users in New York, "To make it your standard, you've got to invest some skin in it."

you've got to invest some skin in it."

Baboock is Computerworld's senior editor, soft-

# DP systems CONTINUED FROM PAGE 23

n sides on Unix supermicros and minis, controls the application's logic, data base requetts, user algorithms and security s, checks. The third layer places the data base on a Unix-based supermini or mainframe computer. IBM VM and Digital

Unify anno

Equipment Corp. VMS versions are forthcoming, and access to IBM MVS data bases will be provided via a standard SQL interface, the vendor said. Initially, Unity is putting its Accell Integrated Development System, an application development product, under the architecture — Accell/CP and Query/CP, which will be available in June. Accell/CP enables an Accell application's user interface to be off-loaded to an IBM PC-DOS micro while the application functions and data base continue to reside on the larger Unix system. Only Accell-developed ap-

Unix system. Only Accell-developed applications work under the architecture. Nierenberg said that Accell/CP will cost \$100 to \$200 and Query/CP will cost \$400 to \$500.

Nicrenberg added that the Cooperative Processing Architecture goes a step beyond distributed data base systems, on which data is shared among various systems and departments. "The combination of data distribution and processing distribution is what we're calling cooperative processing."



nced two products for the

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hat, efficient information restricts is combin in even the largest damboos. ASSS was "Jun pals" Indexing techniques, providing at imple, yet powerful gray years for the sales complex searching day. Notice and causal menmy restricts information and passed on years of the sales of the sales of the process using course and magnificial

# Developing

CONTINUED FROM PAGE 23
World Trade Center recently. Marilyn
Bohl, DB2 product manager, and Sharon
Weinberg, president of Codd & Date Con-

sulting Group in San Jose, Calif., answered questions from users after addressing the group.

One user, who runs both IMS, IBM's established DBMS, and DB2 in his shop, asked why he should develop a new application using DB2 if he has a simple parentchild relationship that requires referential

integrity.

Weinberg responded that users should develop applications using DB2 because the return on investment (ROI) is much

greater than with IMS. The ROI using DB2 was 95.3% during a five-year period vs. 53.6% when using nonrelational data

### 'Relational the key' The gain is achieved through a shorter development cycle and greater case of main-

ses, she said

velopment cycle and greater ease of maintenance. "It's ben determined that relational is the key to this," she said.

The fact that IBM is using terminology

The fact that IBM is using terminology like "secondary keys"—rather than forcign keys — and has yet to implement domains, means the firm is a long way from supplying these features. Weinberg said. She criticated IBM for being alow to private referential integrity, which allows a DBMS to match changes in a primary key with a foreign key, maintaining the integ-

### ity of data.

"If you want to create rot in your data base, like you have in IMS for the last 18 years, that's well and fine," she said. "But I can assure you that the board of directors of your company, CEO and vice-president don't want your companies to rely

when sake of it tables created without referential integrity would be affected once it became available. [BM's Bohl sand, "Many of the things needed for referential integrity indeed already exist in the catalog for any new release that may come along. Certainly, it is our intent to minimize the impact."

Some users say they are experiencing productivity gains using DB2 to develop applications. Mark Karpitovsky, a consultast and panel member, said he is currently working on a project in which two production systems supporting more than 100 users are running on a dedicated

mainframe.

"The first DB2 application we developed consisted of about 17 or 18 programs, 18,000 hnes of code," he said. "I'd say the total gain in development time was

about 25%."

One user asked when IBM would provide an on-line performance monitor for DB2. "It's kind of hard for me to accept having a state-of-the-art data base engine and a batch monitor that lets you look are reports a day or two later." The declared. Bohl said IBM has yet to draw up plans for developing an on-line monitor. "It's a

# Users laud SAS CONTINUED FROM PAGE 23

In addition, a C-based product line that was transparent across operating systems could install very quickly, she said. Redoing the underlying architecture is also a necessary move. "I think SAS Insti-

Redoing the underlying architecture is also a necessary move. "I think SAS Institute found itsel building a house one room at a time. At some point they said, "Maybe we should get some structure in here." Hermes Smith said.

Wendell Refior, research analyst with Boston Edison Co. in Boston, recommended that SAS Institute produce "more complex report writing capability with complete customization features.

with complete customazation features.

"You don't have enough flexibility to do the things you want — to do a printout phone book-style or stop halfway down the page with a new heading and indentation." Its ackled.

### eport-writing topa wish list loodnight said in an interview that the

SAS base product allowed a large number of reports to be generated "with one or two statements." He acknowledged that complex report writing procedures remined near the top of the hat of SAS users' wishes in an annual ballot of SAS users' model.

ers needs.

The base SAS System and many addons are available under DEC's VMS operating system and PC's as well as IBM mainframes, where the product line was
concentrated exclusively until late 1984.
Several SAS users urged further expansion of the PC product line.

SAS Institute is working on Inhang SAS products that run under DEC, SMS operating system to PC, via a limit that well move data sets across the link with a ungle statement, said Greg Secer, a bindigost with the Canadian Department of Fusionies in Natione, B. C., as the extreet an exhibition of the structure of the tink. The VMS-to-PC link will go into beta text this month, be said.

SAS spokesmen said PC versions of SAS Applications Facility, SAS Graph and SAS Full Screen Product will be announced later this year.

Another SAS user on PCs. Kenneth Whitesides, an information center consultant at Duke Power Co. in Charlotte, N.C., said the Institute needs to find ways to work around the 640K-byte memory limit on PCs.

Duke Power attempts to use the SAS PC base product and SAS/Stat on IBM 3270 PCs and finds it can only upload or download limited data sets with the memory that remains.



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# w Systems software

E

Kolinar Corp. has introduced Release 1.3 of its SQL/Exec, a VM/CMS product for users of

SQL/Exec is said to allow us

nd from Exec2, Rexx or the IBM CMS command line. It helps users build a custom data base annication. Features of Release 1.3 include simplified installation and faster execution speed. Oth-er features include automatic error-message handling, timing

0 D υ c stitute symbols for null values. SQL/Exec is priced at \$6,000. Optional maintenance costs \$1,000.

Kolinar, 3064 Scott Blvd., anta Clara, Calif. 95054. Sterling Software has an-nounced Release 7.5 of its

DMS/OS data storage manage-

DMS/OS Release 7.5 include the ability to back up and recover catalogs. Enhancements to program development system han-ding are said to permit processing of data sets in which logical errors have been detected as well as merging individual mem-bers into a library from backup or

archive copies. Improvements in archive

expired data sets from the archive or backup medium and to produce duplex copies.

The basic DMS/OS system is priced at \$14,000. Sterling Software, #100 11050 White Rock Road, Ran-cho Cordova, Calif. 95670.

ability to merge onto disk any un-

national, Inc. has announced Release 1.0 of its CA-Outiser II, a code optimist debugging and source analyza-tion product that supports the capabilities of IBM's Cobol II and MVS/XA operating environ-

CA-Optimizer II is said to pro-vide a split-screen Cobol II lan-guage Help facility. Other enhancements include optimization techniques enabling the optimiz-er component to handle programs up to eight times larger than previously possible.

CA-Optimizer II Release 1.0
is priced at \$48,000 for IBM's
MVS and MVS/XA operating en-

ronments. Computer Associates, Stewart Ave., Garden City, N.Y.

RD Labs, Inc. has announced Release 3.3 of its RD/Share library management and control system for IBM's VM/CMS en-

RD/Share is said to provid for version control of source for version control of source files, auditing of changes, securi-ty over access of files under the system's control, prevention of concurrent updates, data com-pression and management re-

Release 3.3 includes a new Rexx-based guard file facility and the ability to pre-emptively trap and disallow transactions without communicating with the ser-

RD/Share Release 3.3 is riced from \$5.675 to \$13,675

RD Labs. P.O. Box 255832, Suite A, 1783 Tribute Road. Sacramento, Calif. 95865.

# Applications packages

Tigera Corp. has announced Word Era, a word processing program for multiuser Unix-

Word Era includes a Wang Laboratories, Inc.-compatible interface and document conversion canabilities. It supports the windows environment as well as voice recognition and voice an-notation. Other features include math function support for screen and keyboard input; block copy. move and delete functions; full-featured footnoting; password protection; index and table of contents generation; and spell-

Word Era is priced from Tigera, 350 Bridge Pkwy., Redwood City, Calif. 94065.



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FEBRUARY 16, 1987

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1279 Oakmead Parkway, Sunnyvale, CA 94086

Access Technology, Inc. has announced Release 2 of its 20/ 20 integrated spreadsheet soft-ware for AT&T's 3B2, 3B5.

3B15 and 3B20 computers.
Release 2 features more than 50 enhancements, the vendor said. Specifically, additions incell notation; advanced macro capabilities, including work cell noneccapabilities, including sheet-based macros; new range commands, including range and local rounding;

name; goou and socal rounting; work sheet password protection; and an enlarged matrix.

Other features include an ex-panded data import/export capa-bility and improved ability to move spreadsheet models be-

20/20 Release 2 for the AT&T computers is priced from \$1,200 to \$5,800.

Access Technology, 6 Pleas-ant St., S. Natick, Mass, 01760. Data Center Software has anunced Watch, a calendar and

phone book management system for Digital Equipment Corp. VAX and Microvax computers. Watch is said to maintain pernal or project schedules and other timely events. It will print or display any selected entries for any given time period. The multiple names and telephone

any selected entries can be printed or displayed.
Watch is priced from \$450.
Data Center Software, 447
Old Boston Road, Topsfield.

Mass. 01983. State of the Art. Inc. has add ed three accounting application modules to its MAS 90 Master

ccounting series. The three module ry Management, Sales Or-

der Processing and Purchase Or-der Processing. They can be integrated with other MAS 90 modules such as General Ledger ive report the vendor said. Features of th accounting series include the ability to generate numerous

prement reports. The modules are priced at \$795 each. State of the Art, 3191-C Air port Loop, Costa Mesa, Calif. 92626.

MCBA, Inc. has announced its Labor Performance package for the Wang Laboratories, Inc.

VS line of computers. The package was designed to help businesses track employee production statistics, identify productivity problems and imove labor utilization. It sup ports clock-card entry and edit

numbers for a single entry, and ing and, by integrating with MCBA Payroll, permits the pay-roll to be calculated automatical-ly from clock-card data. Other features include the

ility to analyze performance productivity, use files created by ta terminals, allow centrali labor transaction entry and pro le for an incentive system.

Prices for MCBA's accountg, distribution and manufactur-

ing software for the Wang VS family range from \$2,000 to \$12,000. MCBA, 425 W. Broadway,

Glendale, Calif. 91204.

Iris Software has announced Version 2.0 of its Dgen/36 software for the IBM System/

The product is said to gener-ate on-line Report Program Generator (RPG) program documen-tation. Version 2.0 offers an enhanced RPG listing procedure featuring action diagrams coning all DO, IF and CASE ents with their matching END stations. Also, all GOTO: and TAGS are bracketed Field length and array information can

to the far right of each be printed to the far right or I-, C- and O-spec line and do defined, and unreferenced fields are flagged.

A single CPU license costs Iris Software, P.O. Box 4594,

Suite 219, 119 Broadway, Chico, Calif. 95927.

J. D. Edwards & Co. has an-nounced Pastr, a financial re-port writer for use with its World Systems for the IBM System/38. Fastr is said to extract information from World Systems ac-counting data bases. Any catego-ry of data defined in the chart of

counts can be selected, sorter and printed in a specific financial Design capabilities includ

exception and variance report-ing, multiple levels of subtotaling and control of column and row formatting. Fastr costs \$7,000. J. D. Edwards, Suite 5500,

4949 S. Syracuse St., Denver, Colo 80237

Application Development Systems, Inc. has announced Xpediter/CICS, a testing and agging package for running under MVS or MVS/XA.

Xpediter/CICS is said to pro ride source-level testing and de-ougging for CICS application rograms in the CICS region. It

code display. It can be used to control the execution of the program, display and change variable values and simulate unwrit-ten code. It can also intercept application abends and prevent application programs from ac cessing storage associated with

Xpediter/CICS is priced from \$19,000 Application

Systems, 6840 78th Ave. N., Minneapolis, Minn. 55445, SQ Software has an

Release 3.1 of its Structured Query Report Writer (SQR) for Oracle Corp.'s Oracle relaal data base SOR is said to cor

query definition with print con trol, formatting and procedural logic into a single, structured paragraph. It also supports ful-screen document editing, page headings and footings and input and display commands for interactive query m Features of Release 3.1 in

clude the ability to read and write external files, define multidimensioned arrays, pass report argu ments at runtime and include common source modules. SQR is priced from \$295 to

\$10.500 features user commands and a SQ Software, 2000 Lee Road scrollable full-screen source Cleveland, Ohio 44118.



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# MICROCOMPUTING



# Printer's come a long way

In the summer of 1983 I bought an IBM Personal Computer with my own money. I already had one in my office at International Data Corp. (IDC) that had been

id for by the company.

I knew I couldn't get IDC to pay for a home computer for me, but I also knew that I could get a or at home. So I digged deep into my savings account and paid \$5,244.70 of my hardearned money for an IBM PC with a color monitor, 320K bytes of random-access memo ry, word processing software

My local computer store dn't have my first choice of a printer, so they loaned me an-other, less expensive printer to use until they got a shipment of the one I really wanted. I took

a Gemini 10X printer from Star Micronics, Inc. I never did get the printer I'd orignially ordered. By the time it came in three weeks later. I was

# SQL makes its mark in PC arena

BY RICHARD FINKELSTEIN Structured Query Language (SQL) has arrived on the personal computer, and we are already ginning to feel its impact. In fact, many major corpora-

tions and government agencies contacted by Computerworld are standardizing on SQL within their data processing and end-user organizations right down to the microcomputer level — and

for good reason. SQL is a powerful but terse data base language that is meant to be used by applications develment personnel. SQL's strength lies in its strong theoretical un-

# Clones a deal for colleges

BY JAMES A. MARTIN

PHOENIX - In an effort to obtain more for its money, the Mar-icopa Community College consortium recently invested \$4S3,000 in some low-cost, build-your-own IBM Personal Computer clones, saving more than half the cost of buying

name-brand microcomputers.

"To buy that many micros from traditional vendors would have cost us about \$1.4 mili so we chose to buy the compo-nents and assemble them our-selves," says Larry Christian-

n of administrative Continued on page 36

derpinnings. Unlike its prede-cessors, SQL was designed with a mathematical foundation, which gives it stability, predict

ability and usability. Though E. F. Codd, president of The Relational Institute in San Jose, Calif., believes IBM could have done a much better job de-veloping SQL, the language is still a major step in the right di-rection. "There are problems

rection. "There are problems with SQL, but it is far superior to other languages. With SQL, you can do set processing, which is much better than the row-at-a time processing required by Co-dasyl (network) or hierarchical data bases," Codd says. Set pro-cessing requires fewer steps to

# It is also important that with SQL and the SQL cata-

log structure, an organization is muranteed to have a data base management system that meets seven of Codd's 12 rules for relational data bases - with the capability of eventually meeting all 12 rules - and can therefore he considered a true relational data base. These rules define the criteria a data base must meet to be sidered fully relational.

trict government of Washington D.C., recognizes the benefits of Continued on page 32

# **Package** tans extra memory

BY DAVID BRIGHT SANTA MONICA, Calif. - A

memory management software package that helps Intel Corp. 80386-based personal comp ers address up to 16M bytes of nded random-access memo ry (RAM) was recently an-nounced by Quarterdeck Office

Systems. Called Quarterdeck Expand ed Memory Manager-386 (QEMM), the \$59.9S product reportedly allows Microsoft Corn MS-DOS-based applications software that supports the Lotus/Intel/Microsoft Expanded Memory Specification (EMS) to access either extended or EMS memory in a system. EMS is a scheme for bypassing the 640K-byte RAM limit imposed by the MS-DOS operating system.

Quarterdeck officials said QEMM's ability to treat extend-ed memory as EMS memory allows the user add memory to an 80386-based system without worrying about whether it is Continued on page 32

ick Assoc hances Statpac Gold. Page Matrox Electronic Sys-tems offers a two-board set-for the IBM PC AT. Page 42.

# Data View



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used, future plans, applica-tions and DP executives' names, titles, and phone nes, titles, and phone nibers. An index provides ck access to 133 cross referquick access to 133 cross references by hardware, software and industry. Price: NY 4700, MA 4395, and NE 4395. Call (212): 683-060. Computer Management Research, Inc. 20 Waterside Plaza, NY, NY 1000.

### MICROCOMPUTING

### SQL PROM PAGE 31

languages based on Codd's rela-tional model. "The advantages provided by relational techno ogy are generic and intentionally so. As a theory-based, unified approach to data base manage-ment, it aims at simplification to increase user productivity and

flexibility to handle chang Thus, using a terse, simp nonprocedural language like SQL benefits the micro user no less than the mainframe/mini user. He writes less procedural code, memorizes less syntax and does not seed tedious menus and prompts to take advantage of the systems automatic optimization and multiple records-at-a-time processing," Pascal says.
"If there is one thing the data

\_\_\_\_\_\_ series one thing the data processing community has learned, "says Ken Cohen, direc-tor of marketing for Oracle Corp., "is that standards are im-portant."

'Strategic decision' These sentiments are echoed by

Richard Porter, director of management information services for Nestle Enterprises Ltd. Can ada. "We have made a strategi decision to go with SQL bases on comp ility and portabil he says.

Another company standardiz ing on SQL is Amoco Corp. How ing on SQL is Amoco Corp. How-ard Fosdick, senior data base ad-ministrator for Amoco, explains, "We started using SQL early on our large IBM MVS and VM ma-chines. We felt, in order to keep training costs down and prom ortability of programs across portability of programs across different machines, we should standardize on SQL." Standardization also in-creases the ability of end users to communicate with professional

data processing personnel.

Robert Osacky, manager of data base administration at Commonwealth Edison Co., says be feels that "users who work with SQL on PCs are able to more effectively communicate with the DP staff."

Standardization also trans-lates into productivity. Osacky, who managed the implementa-tion of IBM's DB2 on the main-Continued on page 37

### **Package** FROM PAGE 31

EMS or extended memory.

According to Gary Pope,
Quarterdeck executive vicepresident, extended memory is
defined as any amount over 1M
byte. Extended memory does not require the extra mappin circuitry of EMS and is typicall

QEMM is similar to the ex panded memory manager in Compaq Computer Corp.'s Deskpro 386 system, Pope said. "QEMM provides to the rest of the world what Compaq provides with its memory ma

er," he added.

QEMM can reportedly he used with 80386-based systems, as well as with accelerator boards that are based on the 80386. While QEMM complets Quarterdeck's Desgview Descriew is not required

### SCIENCE / SCOPE®

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Delayeron has goon that could first up after a form fire can be focused by ranges. Inspections are made by aiming a lander bid Bighart Probley "aftered viewer while flying over the arts in a n helicoper. The Probley viewer uses heat the way a camera sees light, converting it instantly into an helicoper. The Probley viewer too despress, Additionally, mining efficials report ancess using "Probley viewer too despress, and the problem of the

Brazil has expanded its telecommunications service over that the sep Braziline? a settline has goes into operation. The spacecraft joins for summing the witherest using the Austraces along the Austrace Basis with the common settlement of the services of the Austrace Braziline and the Austraces and the Austraces and the Austraces and the Care Braziline and telecommunications agency. Hope the summing the Braziline and telecommunications agency. Hope the supplied austraces reflectors, solar cell arrays, proposition systems and other electronic components and subspections.

A new electronic "road map" will enable pilots of helicopters and small tactical fighters to fly safely over unfamiliar territory without the need to wrestle with flight charts. The Integrated Terrain Access and Retrieval System (ITARS), under development by Hughes for the U.S. Air Force, will display color-coded surface features and man-made structures. By touching a button, the pilot can show terrain data in look-down or look-ahead views. The system will share its stored data with other systems aboard the aircraft to aid in navigation, terrain following and avoidance, weapon delivery, mission planning, and

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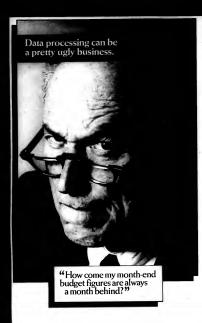
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### Printer FROM PAGE 31

kept it, applying the \$162.75 price difference toward a 300 bit/sec. Hayes Microcomp Products, Inc. modem instead. The Gemini 10X did everything I needed out to well to my origi

I was also impressed with its simple but rugged construction, removable (and replaceable) print head and the fact that it used simple, inexpensive Unrwood typewriter ribbons instead of the special ribbon cartridges most other printers required. In fact, I've still got

the old Gemini 10X and use it as a ckup printer. The Star Micronics NB-15 24-pin, letter-quality dot mats printer introduced last summer shows that the company has come a long way from simply being a relatively unknown source of lower cost printers.

The NB-15 is about as state of the art as wire dot matrix printers get. List priced at \$1,449, but typically available from dealers for quite a bit less, the NB-15 offers a host of features that make it an attractive product for anyone who wants just about everything a dot matrix printer

has to offer. It produces solid 24pin letter-quality output at 100 char./sec. and blazes along at 300 char /sec. in draft mode. The NB-15 has the same straightforward, solid, reliable

estruction of my Gemini 10X, although it does require a special ribbon cartridge. Clear-ly engineered for durability and serviceability, it looks just as ely to keep on working year after year as my old 10X has

Removable font cartridges priced at \$59.95 each offer Prestige Italic, Letter Gothic, Cou rier, Courier Italic and Orator fonts in addition to the Prestige font that is built-in. Two cartridges at a time can be mounted in slots on the front panel of the printer. It comes wi

16K-byte, built-in print buffer that can be optionally expanded to 32K bytes The Star NB-15 can opera se fully compatible with the IBM Graphic Printer and also the Epson America, Inc. LO1500. The built-in tractor feed easily handles fanfold pape from 4 to 15.5 in. Micro adjust-

able spacing provides precise forms alignment as well as high resolution graphics capabilitie Special characters can be ed and downloaded to the printer with appropriate software, in addition to using the read-only memory character font cartridges. Double and quad oversize characters can also be printed. Ten international character sets as well as the standard U.S. character set can be

Best of all, the Star NB-15 puts a wide range of controls conveniently on the front panel. Form length, type style, mos

(draft or letter quality) and print pitch (pica, elite, condensed and proportional spac-ing) can be directly selected from

the panel switches.
Other panel controls include micro feeding for lining up preting of left and right margins, so lection of the IBM graphics printer compatibility mode, a Power On self-test and a hex

dump facility that can be helpful in program debugging. The front-panel control for these features makes it easy to use them even when using soft-

ware without printer drivers written for the NB-15. The Star Micronics NB-15 is a first-rate printer that will stand up well against competitive offerings from better known ven-

Zachmann is vice-presid at International Data Corp.

### Clones FROM PAGE 31

vices at Glendale Community College, one of the seven colleges in the consortium.

After considering their hardware options, college adminis-trators decided they could inexexpand pensively expand the consortium's computer-literacy program with PC clones. Taking that one step further, the staff at Glendale Community College saw the possibility of addition savings by building the clones

"It would have cost us about \$20 a unit to build the PCs our-selves," Christiansen says. "But we got a bid to assemble them for \$7 a unit, so naturally we went

All but 12 of the some 600 mios are PC XT clones with 256K bytes of random-acces memory, dual disk drives and monochrome monitors. The rest are PC AT look-alikes with 20Mbyte hard disks and color mon tors. Rycom Corp., a microcon puter parts supplier in Phoer rformed the actual assembly of the micros, although MIS sup-nort staff at the colleges built

several as well.
"The size of this job was quite unusual," says Michael Shu-

maker, Rycom president. was the first time we had asse bled that many micros for any-

one." Shumaker says low-cost PC clones are becoming more of a viable alternative as prices drop and technology impr "It's simply a matter of economics," he adds.

Glendale received the bulk of the micros — about 330 — with the remaining dispersed among the other colleges. When the micros arrived on campus, techni-cal staff at each of the colleges performed first-line trouble-

oting. The failure rate for the clones has been about 10%, according to Christiansen, who says tha figure is average. End-user sup port is offered by the technical staff at each campus and from the central repair site of 65 pro ners, technicians and other

The PC XT and AT clone solution provided more in savings than just dollars. "Part of this entire process was an education for our computer staff," Christian-sen says. "As a result of dealing with these machines on a comp nent level, they became much more knowledgeable about the inner workings of the system. It was an on-the-job training opportunity to bring our technical staff up to speed on these units."

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per printed page. But price is only half the equation. If a laser printer isn't versatile, it's not worth the cost of the power it consumes.

The GO-3500 delivers versatility and size with a long list of standard features including 640K memory, a superior 150 page sheet feeder, Centronics parallel interface, and

seven resident type fonts. The GQ-3500 has two built-in IC card slots that accommodate a wide selection of font cards and emupaper tray, you can

lations, and the new Epson Selectype IV Control Panel for easy control of even key printer functions like paper size, multiple copies, pitch, font selection

Versatility is the strong suit of GQ-3500 options. too Try 1.5 MB of memory, big enough for a full page of 300 DPI graphics. Try an optional serial interface and HP Lasenet Plus" and Diablo\* 630 emulations via plug-in IC cards With Epson's optional

### Use of SQL

CONTINUED FROM PAGE 32 rame and has introduced SQL to his PC users, argues that impleting SQL on micros and nputers has a twofold ef-

fect on productivity 'SQL on the micro can be d as a training tool. Users unrstand the mainframe system tter after working with the mi-o version," Osacky explains, adding that be plans to extend the use of SQL on the micro by ng it as a prototyping tool for inframe applications systems.

Pascal agrees that prototyp-ing and developing mainframe stems on the micro is the end. "With similar DBMS/SQL implementations on the micros most of the development effort will be off-loaded to micros where each programmer can write, test and debug applications without affecting or being affected by other users," he

Tony DeMeo, data process ing manager for the Village of Northbrook, Ill., is using Oracle products to support all municipal operations. "End users do their own ad hoc queries and report-ing using Oracle's SQL. SQL is also used for all application de-velcoment," DeMeo says, "Everything we do is based upon SQL."

says he feels that, be se of SQL, end users can n do work formerly requiring da processing professionals. technical staff now has more

e to work on solving more dif-Tony Schaller, manager of systems development with Car-negie-Mellon University, is managing a long-term strategy to connect 6,000 to 8,000 PC orkstations with the universitral to this strategy are Ingres, a

line of products from Rela echnology, Inc., and SOL 'Must be portable'
'People will not spend the time

to learn a language unless it is portable. With SQL, users are trained only once, and then they are able to access information from any one of the university's data bases," Schaller explains.

Nestle Enterprises is also ursuing a distributed data base pproach. Porter's intention is to have Ingres running on all Digital Equipment Corp. VAX minicomputers by the end of this year. Concurrent with this effort, Por-ter plans to begin off-loading ap-plications to PC Ingres and ownloading mainframe data to al computers using

the Ingres Link product. SQL is a growing langu New tools that enhance its o nce its cape bilities are being brought to the market almost daily, with in-creased usability as a major area of concern. "The main weakness of today's SQL DBMSs are their d-user facilities," Porter says We expect to take advantage of third-party software, esa in the areas of graphics and natu

ral-language query front ends Oracle has already integrated several end-user tools to en-hance the spreadsheet and graphics capabilities of the Ora-

SQL on link standard One of the primary areas of re-search is artificial intelligence and expert systems. Arity Corp. recently introduced a product

that integrates SQL and Prolog into one system. Peter Gabel, president of Arity, states that SQL has emerged as the standard for cooperative managent between micros and m frames. Arity recognizes the importance of combining automated expertise with traditional

data base processing."

Suzanne Mamet, assistant di-rector of data administration at rector of data administration.

Travelers Insurance Co., is exring the use of expert syst ort of data base design.

Mamet's project captures data used for data modeling and stores it in relational data bases. "Because much of our current design work involves relational technology, we have opted for a version of Prolog that contains an SQL development package that is highly compatible with IBM's SQL," Mamet says.

ANSI standard inadequate While the use of SQL continue to grow, the American National Standards Institute's (ANSI) Standards institute a crisisal proposed SQL standard is injude quate in defining the language. Sharon Weinberg, president of Codd & Date Consulting in San Jose, Calif., is disappointed with he committee's proposal.

They chose the least common

denominator of all the implemen-tations," she says. Weinberg points to the lack of a standardized SQL catalog as a major deficiency. When working with different SQL products, one also notices that vendors tend to on commands, expand the lan-

guage, deviate in how a particu ir command executes and rovide vastly different applications development tools. ANSI and IBM provide no real help in

Codd says be believes that vendors must also move toward

full support of his relational mod el. This includes support for primary and foreign keys as well as domains. Currently, the SQL data definition language does not address any of these issues

As a result, implementations of SQL, both on mainframes and micros, cause unnecessary data integrity problems that applications developers are forced to deal with on an application-byapplication basis. Of course, when the relational model is fully implemented, users will have to absorb additional costs to convert their systems in orde take advantage of the DBMS's new capabilities

Since SQL is still in its infan cy, there are sure to be many more breakthroughs that will en-hance the capabilities of the lan-guage. By choosing SQL now, you will not only have a language that can increase application pr ductivity and mability today but will also position your organiza-tion to take full advantage of the technological advances of the fu-

Finkelsten lectures for the Reistonal Institute and consults for Codd & Date Consulting His company, Performance Computing for Invated of Charges and colors in SQL data base management then the "SQL Review" news

load up to 400 sheets of paper.

The GQ-3500 works with the vast majority of IBM® compatible hardware and software. and comes with our one-year limited warranty. All this in a machine that's 37% smaller and 49% lighter than the HP Lasenet Plus, It's iust what you'd expect from Epson, a company with a

twenty-year record of microcomputer product innovation, reliability and value So take a look at the new Epson

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Symphony\* is the one software product no business and no business person can afford to

be without. Based on the 1-2-3\* spreadsheet technology, Symphony pulls together five key functions in one program. Functions that help a marketing manager work smarter. Give a financial analyst a clearer picture. Run an entire company more effectively.

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One product to train on. One company to support you. One investment that grows over time. For all these reasons, you should consider standardizing on Symphony to meet the personal computing needs of your corporation.

# Lotus Symphony

A complete general-purpose software tool built around the world's leading spreadsheet technology. © 1987 Letus Developes

# NEW Software applications packages

Walonick Associates has en-hanced its Statpac Gold statis-tical analysis software with a forecasting module.

The module provides explortory data analysis, time-series

The Statpac Gold base pack age contains three regression modeling techniques. The mod-ule adds 11 forecasting methods. Statpac Gold costs \$595. The

forecasting mo dule costs \$195 lonick Associates, 6500 et Ave. S., Minneapolis, Minn 55423

Felsina Software has an-nounced A-Talk Plus, a terminal program designed for the Commodore Business Machines, Inc. Amiga that supports Tek tronix, Inc.'s 4010/4014 graph

A-Talk Plus is said to support the standard Alpha, Graph and Graphic Input modes and two en-hanced graphics modes. Vector line formats include solid, dotted, short-dashed, long-dashed and dot-dashed lines.

addition to Tektronix nics emulation, A-Talk Plus includes communication tools, as well as a multitasking spooler. capture buffer, a custom voice

modem types. A-Talk Plus is priced at \$99.95.

Corporate Class Software Inc. has introduced Fastar, a fi-nancial reporting and analysis software package for use on the IBM Personal Computer or com-

PRODUCTS

Exercis said to collect orm nize, manage and consolidate fi-nancial data. The product also alws for international planning

It can perform financial reorting functions such as currency conversions, journal entries and hierarchy roll-ups. It indes audit trails, data verification and password protection ca-

lities, according to the Faster costs \$25,000 for a departmental system supporting up to 25 users.

Corporate Class Software, 1211 Avenue of the Americas, New York, N.Y. 10036. Software Technology, Inc. has announced General Led-ger System-M. Trust Ac-counting System-M and Criti-cal Data System-M for Novell. Inc. Novell Netware and the

IBM PC Network. All three packages are said to w up to nine terminals in a network to make entries into the system at the same time. Each system may be used as a standalone or integrated with the ven-dor's Time Accounting and Bill-

ing System III-M The General Ledger System-M costa \$700. Trust Accounting System-M costs \$500, and Criti-cal Data System-M is priced at \$400

Software Technology, Suite 120, 620 N. 48th St., Lincoln, Neb 68504.

### Software utilities

Micro-Z Co. has announced Direc-Link, a program that transfers files between laptop

and desktop computers.

Direct-Link allows users to copy single or multiple files between computers via serial ports using a point-and-shoot tech-nique. According to the vendor, es are sent at more than

10,000 char /sec. Direc-Link costs \$59. Micro-Z. #4 Santa Bells Road, Rolling Hills, Calif. 90274.

interactive Solutions, Inc. has announced Acacia/OPM. a personal computer software cackage said to measure rese time exactly as experi-

enced by the end user. Acacia/OPM measures by insaction and reports response time as experienced by end users. It includes the sum of bost and network response time The package runs on an IBM sonal Computer or compati-that simulates an IBM 3278 ble that sime

or 3279 using a Digital Comm nications Associates, Inc. Irma or compatible emulation board. It supports any application that uses standard 3270 terminals such as CICS, TSO, IMS, VM/ CMS. ISPF and ICCF

Acacia/OPM costs \$1,995. Interactive Solutions, 53 W. Fort Lee Road, Bogota, N.J.

Insight Development Corp. has announced Laserplotter, a software utility said to prov Hewlett-Packard Co. HP 7470A plotter emulation for the HP La serjet line of printers.

Laserplotter allows IBM Per sonal Computer software to take advantage of the 90,000 dot/in resolution offered by Laseriet printers. It features pop-up menus and the ability to map any pattern to any pen color. Insight also announced Jetwriter, said to provide IBM Displaywriter users with full-fea-

tured printing on HP's Quietiet printers. Laserplotter is priced at \$150. Jetwriter costs \$49.

Insight Development, Suite 140, 1024 Country Club Drive, Moraga, Calif. 94556. Quadram Corp. has introduced

a Lotus Development Corp. 1-2-3 software driver for its Quad-EGA Prosync graphics board. The Prosync board supports

the advanced display capabilities of variable scan monitors. The driver provides users of 1-2-3 fersion 1A with a 120-col. by 25-line display, according to the vendor. Users of Version 2.0 have the additional option of a 120-col by 43-line format. The 1-2-3 driver will be

need with all Prosvnc boards. Prosync costs \$595. Quadram, One Quad Way, er Ge 30093

### Development tools

Expertech Ltd. has announced Xi Plus, a personal computerexpert system shell

Xi Plus is a rule-based exp system said to provide the application generating capabilities of a dedicated artificial intelligence workstation. The product has extended inferencing as well as interfaces for external files graphics and telecommunications. It also features an English language interface for creating knowledge bases and applica-

> Xi Plus rec 512K bytes of memory. It runs on the IBM Personal Computer and compatibles. Xi Plus costs \$1,250.

Expertech, Suite 204, 650 Bair Island Road, Redwood City, Calif 94063

Gold Hill Computers, Inc. has announced its Golden Com-mon LISP 386 (GCLisp 386) veloper for the Comp mputer Corp. Deskpro 386. The GCLisp 386 Developer d to provide a Common LISE programming environment for

ng expert systems and oth idicial intelligence applica tions. These Al applications in natural-language to Ashton-Tate's asse and Lotus Development orp.'s 1-2-3.

The GCLisp 386 Developer is so said to be able to integrate C programs with artificial intellince applications

It supports a large memory erpreter and comp der, on-line of system and an enha ditor with more than 150 commands, according to the vendor.
The 386 Developer costs
\$1,195. A complete Deskpro

386 system is priced from \$7,800 to \$16,400. Gold Hill Computers, 163 Harvard St., Cambridge, Mass. 163 02139

### Software enhancements

movative Software, Inc. Innovative Software, Inc. has announced The Smart Software System Version 3.1 as well as the Smart Word Processor with Spelichecker, The Smart Spreadsheet with Business Graphics and The

usiness Graphics and The mart Data Base Manager. Smart Software System 3.1 is said to feature network-ready capability, allowing the program to be used as either a single- or multiuser package. Multiuser ca-pubilities include file and record and file locking in the word pro-cessor and spreadsheet. In addition, Smart's password protec ion schemes provide integrity for all users of the net work environment

Prices for the packages range rom \$395 for the Word Proces sor to \$895 for the Smart Soft-Innovative Software, 9875 er Road, Lenexa, Kan.

66215

# Printers/Plotters/ Peripherals

General Parametrics Corp. has introduced the Printmaker 20C and Printmaker 20X desktop printing products designed to provide transparencies and hard copy in full color with ermal and ink-jet printers. Printmaker 20C proc

1,000-color output in both land scape and portrait forms.

The product is said to include
the California Computer Products, Inc. 5902G thermal print-

Printmaker 20X allows us to produce 1,000-color output with the Xerox Corp. 4020 color ink-jet printer. It offers a color-density mode for color transparencies and a high-resol mode for hard copy and a draft Continued on page 42

We are pleased to announce that Thomas I. Unterberg

has joined our firm as head of domestic and international technology investment banking with

> A. Robert Towbin as co-head of the operation

Shearson Lehman Brothers Inc.

February 9, 1987

# A-Talk Plus is said to support

option and support for more than

Pelsina Software, Suite 275, 3175 S. Hoover St., Los Ange-les, Calil. 90007.

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800:642:0177



COBOL/XE. The Online Applications Development System for the Batch Programmer.

nued from page 40 mode for faster printing of graphics Printmaker 20C is priced at \$5,595. Printmaker 20X costs \$1,960. General Parametrics, 1250 Ninth St., Berkeley, Cshf. 94710.

8070 Plus dot matrix printer.
The IBM Personal Computer-compati-ble printer is said to be capable of multicolor, high-resolution graphics. It comes with both serial and parallel interfaces and a universal power supply. It includes eight standard character sets, such as a bold sans serif Courier font. Optional character sets include a choice of bar codes. Tractor, friction and semiautomatic

single-chaet feed are standard and the

natic single-sheet feed optional fully au er holds up to 250 sheets of paper The 8070 Plus is priced at \$2,099

Dataproducts, 6200 Canoga Ave., Woodland Hills, Calif. 91365 Board-level devices

Matrox Electronic Systems Ltd. has introduced a two-board set for the IBM Personal Computer AT, called the MVP-AT, that combines true-color frame grab A1, that commons true-color raising grau-and high-resolution graphics with real-time image processing techniques. The MVP-AT supports convolutions, frame averaging, histograms, erosion and dilation, profiles, addition, subtraction

Other features include support for non-interfaced, flicker-free display, overlay memory and an enhanced graphics adapt-

The MVP-AT is priced at \$8,995 with an add-on processor module.

Matrox Electronic Systems, 1055 St.
Regis Blvd., Dorval, Quebec, Canada H9P

PGX, Inc. has dropped the price of its HR-1200 series of color graphics

The IBM Personal Computer-compati-ble add-in cards occupy a single card slot and provide flicker-free graphics on 60-Hz, noninterfaced monitors. They offer lutions of 1,280 by 1,024 pixels in either 8-bit, 256-color or 4-bit, 16-color versions. The family also includes two 1,024- by 768-pixel boards Prices now range from \$1,795 to

PGX, 3730 Skypark Drive, Torrance, Calif 90505 Rohrer Electronics & Consulting has announced RB20, an upgrade kit for the Digital Equipment Corp. Rainbow person-

The RB20 allows users to upgrade the Rainhow with a 21M-byte Winchester



# The Art Of Showing Off With A Wall Protocol Converter

and nonlinear transformation, according

Making anything talk to anything else. PCs, mainframes and System 3Xs. Macintoshes. And more When was the last time you really heard a gasp of surprise! It's getting tougher to show off these days. Everybody's computer literate. takes the user's name, hangs up, checks the outside phone number on which that user is sutherared to call, and then calls that number a Wall Data Protocol Converter being the mape back unto your job. Be a star Put on one or more of the following performances

"YOU COMMECTED ALL THOSE PC., TERMINALS AND EVER MACRITORS TO OUR MAINTRAME?"

How do you let the rest of so talk to your sunframe! With the DCF II " unit, any mix even Macintoshes (with full mouse support) can become 3270 devices to your mainframe And if one of your DCF II ports is connected to a modern, you can dial into the system from home. So after you get the lash to bed you can log onto the electronic mail system and thank

your boss for the promotion your boss to the provinces.

"ALL BRITT HAVE USE YOU GET
THE WHILE REPAIRMENT ORLEST
HINDRONS JUST 1008 2270 HINT FORT?

This one was really easy, Wirk Wild Data's
Communications Flor Expander (CPX\*) just, a
single port on your main/rame! Bront-end can now

support up to eight 3270 controllers or P SDLC cards. Which opens such possibili ollers or PCs with

East. One or more of the CPX expansion ports we use showed off could have been connected to a mous modern. For a many day YOU MEAN WE CAN USE THE SAME HALL PROTUCUL CHIVESTER ON NOTH HAMPRAMIES AND SYSTEM SX47"

e! Everything we said about connecting CPXs and DCF IIs to manuferames applies to the System 3X. That's because they're "software configurable" to become 525 is just as painfestly and easily as they became 3270s. In fact, they even have spare ports reserved for remote diagnostics and troubleshooting. And downloading of the latest software revisions. Once you power up your Wall Data Protocol Converset, you

might as well forget where you put it. Because you'll never have to touch it again. (By the way, if you're a VAR reseller, this is a dream come true). Troubleshooting, monitoring and some of the really slick stuff we haven't already talked about can be done from your terminal. Not on your hands and knees in that dusty old utility closer. What really slick stuff ven't we talked about, you ask! THEY, DOSS! DO YOU MIND IF I START MY OWN KEST"
Because the Wall Data Protocol Converters are the

marrest on the planer (perhaps even the Gislaxy), they have features too numerous to mention in one adstures like dial-back security with audit trail reports. So when a remote callet duls an, the Wall unit unes one wor's name, namps up, creexs toe cursule photie number from which then user is unthronest to call, and then calls that number back and connects the user to the system. Just like the KGB would do it. Or the CIA. Or any company that cares about the security of its dats. So you can be a bette, not a news item about the kecun.

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Suppose you and four co-workers would dearly like to connect your PCs to the mainframe. And suppose the person you've been pour PCs to the mainfrance. And suppose the person you've been competing with for the next promotion doesn't read this all. It's likely that person will recommend equipping each PC with SDIC or COAX cards. Whath means ther cards, five ports on a 37249/276 chanter controller (if you went COAX) and five less PC slors for all the new what bong realf that could have been

plugged into them.

You can save the day, the cluster controller ports and four slots, by suggesting a DATAGATE® card for just one of the PCs! That PC becomes a cluster controller for all five PCs.

2a' That FC becomes a cluster controller for all five FCs, so they can look like \$1280129 reminals to the materiane. Complete with error-checked fit erastlers, unattended operation, Level 2 API and Trock-Fg, washess between FC-DCS and your maintenan-application. Without meteristing with the work normally close on the host FC. Because DMTAGATE has to own processor. All it does a hormer power and an exclusion from a FC. The other FCa connect with the DMTAGATE with SE-3212 sent power.

A year ago, we ran a benchma ad, comparing our features and ance to the other four

people in the protocol converter market. Since then, you might say a wall fell on them. Or Wall wailed. Wall Data has set one record after another. If we can't solve your problem, we'll point you to someone else who can. Because we're the best. And one way or the other, we'll make you a star. That's how we

became the best. It's how we're going to stay that way. Call 1-880-433-3388 or (Wash. only) 1-206-883-4777

Bohrer Flortennirs' PR20

disk, a parallel printer port and a real-tis clock. Software drivers, diagnostics and formatting routines are included in the package

The RB20 is priced at \$1,440. Rohrer Electronics & Consulting, L'Haut Bozon, CH-1801 Mt. Pelerin,

General Parametrics Corp. has an-nounced the Colormetric 20 color graphics card for IBM Personal Computers, PC XTs, ATs and compatibl The Colormetric 20 is said to turn the ster into a full-capability graphics

Users can view images in 1,000 colors, Users can wew misges in 1,000 colors, exactly as they will appear as transparen-cies, hard copy or sides. The card is com-patible with such PC graphics packages as Lotus Development Corp. 's Fresten Plus, Microsoft Corp.'s Chart and Chart-Master from Ashton-Tate. The Colormetric 20 card in priced at \$1,875. A Colormetric Videocable is in-cluded to allow use with standard en-

hanced graphics adapter and color graph General Parametrics, 1250 Ninth St., Berkeley, Calif. 94710.

PC Technologies, Inc. has introduced the 286 Ramracer, which is an accelerator board, and the Rampartner, which the vendor said is a Lotus/Intel/Microsoft Expanded Memory Specification (EMS) or Enhanced EMS board.

The 286 Ramracer is a s MHz accelerator with up to 2M bytes of Enhanced EMS or EMS memory, according to the vendor. Rampartner is a 2M-byte memory board that can be used in conjunction with the 286 Ramracer to provide up to 4M bytes of memory, the vendor said. The product can be used independent

ly, according to the vendor.

Designed for the IBM Personal Com puter, the 286 Ramracer costs \$745 with no random-access memory (RAM) and \$1,225 with 1.5M bytes of RAM.

A daughterboard costs \$150 with 512K bytes of RAM. The Rampartner costs \$360 with no RAM and \$960 with 2M bytes of RAM. PC Technologies, Box 2090, 704 Air-port Blvd., Ann Arbor, Mich. 48106.

# NETWORKING

# Christine Gianone

# and Frank da Cruz

# Kermit leans in popularity

At the foundation of many com nications programs and sys ns installed in business and demic environments is a widely used but largely unsung program named Kermit, after appet frog of the same (used with permission of nson Associates, Inc.). The program is designed to the the classic problem faced by large organizations with ex-tensive multivendor environ-

dgepodge of equipment, in-iding IBM mainframes and Equipment Corp. and Hewlett-Packard Co. hosts, Apple Com-puter, Inc. Macintoshes, Unix communications managers look for — and more often than not fail to find — a networking solu tion that is both comprehensi and affordable.

Columbia University — a with a diverse population of central mainframes, departm ers — confronted just such a problem in 1981. The univer

# LAN industry skyrocketing

BY ELISABETH HORWITT

industry - particularly the man-ufacturing and IBM Personal Computer network segments — enjoyed significant growth in 1986 that should continue dur-ing the next five years, according to the Local-Area Networks re port that was published recently port that was published recess, by Framingham, Mass., re-search firm International Data

Corp (IDC). Among the important ad-vances the industry made last year were standardization of networking hardware and media access methods: reduction of interface costs due to lower priced communication servers and the

### LAN shipments The local-area network (LAN) PC LANs lead in accelera



# T1 switch product line revved up

WASHINGTON, D.C. - Info-

tron Systems Corp. added two products to the high end of its T1 switch product line at the Comsications Network Exposition held here last week.

The NX4600 supports 96 high-speed T1 links per node or up to 4,000 local channels, the

company said. Up to 64 Infotron NX nodes can be interconnected within one integrated network. An NX4600 base unit with full ndancy is priced at \$20,000

NX3000 supports as many as four links and 24 local channels. ible node is \$10,000. Both units support AT&T protocols for Pulse Code Modu-

private branch exchange link that is compatible with AT&T's D4 framing protocols. This enables the systems to interface with AT&T services such as Accunet 1.5 and Customer-Con

speeds, support all network co-pologies and are compatible with infotron's infostream multiplexers and INX switching systems. they enable the construction of varying network configurations.

the company said.

The link speeds supported by the products include 56K, 64K. 256K, 1.544M and 2.048M bit/

ed include point-to-point, dropand-insert, pass-through, ring

# Comten enhances Gateway

BY ELISABETH HORWITT ST. PAUL, Minn. - NCR Com

ten, Inc. last week unveiled versions of the Consten Network Gateway (CNG) and Consten Ad-vanced Communications Func-tion/Network Control Program (ACF/NCP) with several enhanced features. Among these are support of the latest IBM VTAM and ACF/NCP releases and an extended network ad-dressing capability that IBM also offers.

Available with the latest Ver in 4.0 of the Comten ACF/ dressing increases the address size used on an IBM network from 16 to 22 hits This in turn increases the number of address able elements within a network

# subarea from 1,024 to 65,000

 Synoptics, AT&T to develop Ethernet in star topol velop Ethernet in star topc ogy, Page 45.

• Advanced Logic Researc releases 80386-based net-work system. Page 45.

• Mitek Systems announce

SNS Presentation Service VAX and IBM PC-DOS im

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information and guidelines on everything from what to look for in a modem to the benefits of multiplexing. For your free year's subscription. fill out this coupon. Or call 1-800-446-6336. But do it soon. For while it doesn't cost anything to get our catalog, it sure does pay to have one.



# Introducing the most reliable DEC-compatible terminal ever built. The TeleVideo 9220.



### "Why do we want thousands of TeleVideo\* terminals? Because we can't afford thousands of problems."

Susan Kennedy should know Sheis a product analyst at Leasmetric, a company that rents, sells, and services DP equipment all over the country. Including thousands of terminals. And since reliability is crucial to Leasmetric, they tear each evaluation unit apart piece by piece. Then, they give it a series of tests that make MIT exams look east. "Too many terminals just don't measure up," says Susan. "Tve seen machines with questionable ergonomics...keyboards that flex in the middle when you type... even cheap little diodes that could drop off.

"But TeleVideo starts with solid engineering, and follows through with every detail. Overall, they've built the same quality into the 9220 that's made all their other

terminals last so long." And there's more to the 9220 than quality and reliability. There's also an extended feature set, including full VT-220 compatibility. A super-dark 14" amber screen: A tilt and swivel base. 30 programmable function keys. Plus the best thought-outergonomics around. All for exactly \$619.

The TeleVideo 9220. For

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# Star topology Ethernet to be developed

### BY DONNA RAIMONDI

Synoptics Communications, Inc. has aned an agreement with AT&T in which it will develop an IEEE 802.3 Ethrunning at 10M bit/sec. on AT&T's Pre-mises Distribution System (PDS). Cur-rently, PDS and AT&T's Ethernet-compatible network Starian, which runs on PDS, support rates of up to 1M bit/sec.

Synoptics, formerly Astra Communi-cations, Inc., will work with AT&T to achieve PDS certification for Synoptics' Latticenet, a star-configured implemenplished, Latticenet will be able to share the same unshielded twisted-pair cable with AT&T networks such as Startan, ac-cording to Andrew Ludwick, president and chief executive officer of Synoptics.

"What is important here is that we are going to move to 10M bit/sec. Ethernet on unshielded voice [twisted-pair wiring] with the AT&T system. We already offer shielded data cable with the IBM sys-tem," be said. Latticenet currently runs on the shielded twisted-pair wiring ver-sion of IBM's Cabling System wiring and supports a rate of 10M bit/sec.

We are delighted to have Synoptics among the companies who have endorsed our PDS wiring plan," an AT&T spokes-man said. There is no AT&T equity involved in Synoptics' product development effort, however. When the products are ready. AT&T will put them through a rigorous certification process in which it will "try in every way possible to technically

break" them, the spokesman sa mentation of Latticener will support both fiber-optic cable and unshielded twisted-pair wire, which is de ed for data as well as voice tran sion. Using proprietary technology, the up to 330 feet from the wiring closet, Syn-

### T1 switch

ock transe digital bridging. With clock transparency, user's network can accommodate the user's network can accommodate multiple clocks from varying facilities, such as satellite, private fiber-optic and different carrier-provided links, without clock slippage or information loss. Digital bridging lets a single front-end processor poll multiple controllers locat-

ed at different NX nodes. By using the In-fostream NX backbone network for the data path, the user can reportedly avoid the expense of multiple analog facilities to the multidropped remote controllers. Infotron said it plans to support the ex

nges with its Integrated Network Manager in the near future and that it is committed to developing IBM Netvsew/ PC support for its NX family.

# First 386-based network system bows

ALR provides comprehensive, one-vendor networking system

BY PATRICIA KEEFE

IRVINE, Calif. - Advanced Logic Research, Inc. (ALR) has introduced what it said it believes is the first Intel Corp. 80386-bar

ed network syst The ALR Network 386 features ALR's Access 386 personal computer as a dedicated file server, ALR's PC2/286 PCs as workstations and Novell. Inc.'s Advanced Netware 286 network software. We think that this complete system approach will be well received by dealers

and vendors alike. It will be a one-vendor roach where a major manufactures like ALR will offer all the hardware for a nplete system approach," observed we Kirkey, ALR's vice-president of

les and marketing. les and marketing. Corvus Systems, Inc., Compaq Comogies. Inc. have all released 386-based

orkstations that they are also seiling as network file servers. Network vendors, including Novell and 3Com Corp., are working on a 386 file

server solution to bundle with their net

The ALR Network 386 systems are

available in preconfigured four- and eightuser systems, and additional nodes for up to 255 users can be added Complete ALR network 386 system

prices begin at \$16,995 for a four-user system that includes a 386-based file server, an 80M-byte hard disk drive, a 60M-byte intelligent tape backup, four PC2/286 IBM Personal Computer AT compatibles, five ALR Network 386 Arc--compatible network adapter cards, an ALR Network 386-active eight-way hub connecting cables and installed Advances

The ALR Network 386 is available through authorized ALR resellers.

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200 different machines and

Since Kermit is largely en-

hanced and implemented by in

lic-spirited volunteers, Kermit

operating systems

Kermit tips availab

### Kermit leaps FROM PAGE 43

sity solved its problem by d veloping Kermit, an RS-232based communication protocol designed to accommodate dissimilar types of computers, operating systems and file sys-

Kermit is especially suited to micro-to-mainframe conn tions for both IBM and non-IRM systems but works email: wall for PC-to-PC or maintions. Kermit programs pro-

Comten

FROM PAGE 43

according to Con product

nt-end proces

manager

addressing feature also permits ACF/NCP 4.0 to handle up to

255 subareas, each of which cor-responds to an IBM host or

The extended address

by allowing more network ele-

ments per subarea, allows com-panies to make fuller use of their

front-end processors, many o which are underutilized,"

With the enhancement, users

blocks of data over an Syncl

cilitate SDLC con

Because Kermit has always included source code and a protoecification, it has been fered with IBM's ACF/NCP Version 3, according to Comten.

vide error-checked transfer of

text and, in most cases, binary files through both seven- and

The only requirements are

Kermit software running on each

frame versions, also feature ter-

lation, usually of the

an asynchronous serial connec-

eight-bit communications

tion (direct or dial-up) and

machine. Personal compu

versions of Kermit, as well as

some of the mint and main-

DEC VT52 or VT100.

oots IBM to punch third feature offered by ACF/ Micha NCP Version 4.0 is support of ecker. The enhanced network

dial-in terminals emulating BSC 3270 protocol. Switched-line devices, such as personal computers, appear to mainframe appl cations as if attached to dicated line while using the less expensive dial-up lines, ac-cording to Comten. This capability is not available from IBM

Becker claimed Comten ACF/NCP Version 4.0 will be available in an early support program in the second quarter and will be made gener-

The Comten ACF/NCP Verally available in the third quarter sion 4.0 also incorporates an enhanced version of Comten's Modulo 128 high-speed link. U.S. licensing fees are as fol-two: For the Comten 5620 Communications Processor ver-sion of ACF/NCP Version 4.0. \$1,936 annually; for the Comten 3690 or 3695, \$1,344 initial fee nous Data Link Control (SDLC) and \$4,928 annual fee; for the n 5660, \$2,016 initially

connection between NCP nodes before an acknowledgement must be sent by the receiving and \$7,392 anni License fees for enl The feature is designed to fa etwork addressing are as fol-ows: For the Comten 5620, \$1,056 annual fee, for the Com-ten 3690 or 3695, \$576 initial

over satellite-based links, ac-cording to Becker. fee and \$2,112 annual fee; and for the Comten 5660, \$864 ini-The Modulo 128 enhan tial fee and \$3,168 anni with a similar feature that is of-

programs come without for-NCR Comten also added a version of Comten Network Gateway (CNG) that supports enhanced network addressi and IBM's ACF/VTAM Versi Release 1.1 and Multisystem etwork Facility.

CNG interco eight independent systems network architecture (SNA) networks without requiring users to change current network-naming conventions, operation management or security.

Host-free subdivision Users can subdivide an SNA network into several smaller units and then interconnect them via the gateway. IBM's SNA Network Interconnect performs the same functions but "requires

heavy mainframe use, while we allow cross-connection without involving the front-end proces-sor and host," Becker said. The new release of Comb Network Gateway will be available in the first quarter

U.S. license fees are as follows: \$1,100 initial fee and \$2,200 annual fee for the Com-ten 5620 Communicationa Processor; \$2,200 initial fee and \$4,400 annual fee for the Com ten 3690 or 3695; and \$3,300 initial fee and \$6,600 annual fee for the Comten 5660

relatively easy for users to immai support or warranty. How-ever, informal advice or supgrams, adapt them to new ays port for Kermit is not hard to find, since the protocols are in wide use in thousands of organi programs. In turn, the results zations around the world. Fur are sent back to Columbia for thermore, Kermit has been add further distribution and the proed to an increasing oumber of commercial software packages cess continues. There are now Kermit programs for more tha dial-up data base services and other products for which formal support is available. Columbia University has

stributed about 6,000 sets of Kermit, approximately 50% to universities and 40% to corpo rate data centers. Approxi-mately 200 yendors, including fi-

nancial analysis software vendor SPSS, Inc. and Crosstalk developer Microstuf, Inc. have implemented Kermit in their communications soft-

The fact that Columbia retains the copyright to Kermit has prevented vendors from slapping snother name on it and selling it at commercial prices as has happened with public-domain communications soft-ware such as Xmodem. The Kermit software is distributed free and unlicensed by Columbia University Center for Com puting Activities in New York.

LAN industry es such as Microrim, Inc. and

FROM PAGE 43 wiring, and the availability of PCbased multiuser application soft-ware packages from leading ven-

Ashton-Tate. The report indicated, howev-er, that LAN products still fail to address problem areas that have plagued the industry since its in-ception. For example, only 15% of 68 large organizations sur-veyed by IDC believe that PC LANs today are effective substi-

totes for departmental min The report adds that "LANs e atili difficult to install and debut, expensive [average cost per PC exceeds \$1,000] and require extensive training. Many organizations are still looking for LAN

which justify cost and difficulty of installing LAN future bright Several favorable trends high-

chted in the report should re-alt in steady growth in LAN installationa, according to the IDC report. The typical PC LAN today links eight nodes; today'a typical PC LAN is also unconnected to other networks or to

However, the report goes on "the introduction of low-cost under \$10,000] Intel Corp 80386-based servers in late 1987 will offer PC networks the CPU power to link more work stations, improve network speed and offer advanced communica-

tions gateway functions.

"However, the full effects of the 80386-based systems will not be felt until Microsoft Corp. makes available a new version of MS-DOS that takes full advantage of 80386's increase with features such as 32-bit adessing and extended RAM nly memory I support.

That operating system is not expected to be released until the ldle of this year, according to

In the overall LAN market manufacturing systems will be the fastest growing segment, with shipments increasing at a compound annual rate of 70% between 1984 and 1991, accord

ing to IDC (see chart page 43).
The overall market during the same period will grow at a pound annual rate of 35% with an expected \$3 billi shipments by 1991. The PC I.AN market will also grow at 35% per year during the same time frame, IDC predicts.

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# NEW Locol-areo network

R O

IBM's 4680 Store Syst

N.Y. 10601. a

(POS) terminals. The 5170 PC AT Med

as a gateway between them and a host

through IBM's SNA/Synchronous Data Link Control (SDLC).

cility Finance Subsystem costs \$1,600 for System/36 Models 5360 and 5362 and \$1,500 for the System/36 Model 5364.

IBM, 44 S. Broadway, White Plains

IBM's Interactive Communication Fa-

Release 5 Modification Level 1 of the

cates with the 5170 PC AT

processor such as the System/36

Mitek Systems Corp. has announced implementations of its SNS Presenta tion Services for Digital Equip s VAX and Microvax comp running the VMS operating system and IBM Personal Computers using IBM PC-

Both implementations utilize Mitek's groach of distributed Systems Network rchitecture (SNA) services for Transsion Control Protocol/Internet Pr col Ethernet local-area networks (LAN) The SNA Network Server provides Eth-ernet LAN connectivity either directly channel-attached to an IBM mainframe environment or re otely attached, with

ds of up to 64K bit/s Pricing for the SNA Network Servers nges from \$21,000 to \$29,500. Pricing for the SNS Presentation Systems ranges

from \$750 to \$4,500. Mitek Systems, 2033 Chennault Drive, Carrollton, Texas 75006.

# Network services

Dow Jones News/Retrieval has intro duced an enhanced version of its Dow es Tracking Service, Track, that ales and news from their micros. Track allows users to create and moni-

tor as many as five groups of up to 25 com-panies contained within Dow Jones News/ Retrieval. Users now have the option of viewing only the news information or stock price quotations of the compa Membership options to Dow Jones News/Retrieval include a corporate mem-

bership for \$49.95 and a personal mem-bership for \$29.95. Track users pay a \$5 onthly fee plus standard use charges. Dow Jones News/Retrieval, P.O. Box 300, Princeton, N.J. 08543.

## Customer-premise equipment

Voice Control Systems has announced the VCS1000 speaker-independent

ice recognition system.

The VCS1000 is said to support an 82word vocabulary divided into three appli-cation areas: home security, machine con-trol and telephone function control. It responds to any speaker without having been trained to the speaker's voice. te computer system for operation.
VCS is priced from \$995, including a

one and voice-response software appropriate for the particular application. Voice Control Systems, Suite 100, 14140 Midway Road, Dallas, Texas

### Links

IBM has announced that the Interactive nication Facility Finance Subsystem of IBM's System Support Program (SSP) for the System/36 has been enhanced to include primary communica-tions support for the IBM 5170 Person-al Computer AT Model 849.

to allow all models of the departmental processor line to com

### Protocol converters

Simpact Associates, Inc. has announced a Digital Equipment Corp./Manufacturing Automated Protocol (DEC/MAP) interface called the MAP7510 849 acts as a communications controller for up to 128 4680 POS terminals, acting

> The product is said to provide an interface to MAP 2.1 broadband networks for DEC Microvax II computers. The subsystem consists of a Q-bus-compatible controller and modern assembly, a distribu tion panel kit and applications interface software for the host

Prices for the MAP7510 subsystem range from \$6,000 to \$12,000. mpact Associates, 9210 Sky Park Court, San Diego, Calif. 92123.

### Electronic moil

Interactive Network Technologies, has introduced Intermail PC. its IBM Personal Computer interface for the

Intermail is a desktop communications system that enables users to exchange electronic mail and files. The Apple Computer. Inc. Macintosh version also allows users to move object- or pixel-oriented images from one Mac to another. Its serv er-to-server feature lets micros on both local and remote networks communicate

Intermail PC is site begoed at \$199 per server for IBM PCs and compatibles.
Interactive Network Technologies, 20 Army Circle, Waban, Mass. 02168



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# SYSTEMS & PERIPHERALS



# IBM invades **DEC territory**

cused during the past year on Digital Equipment Corp.'s in-cursion into IBM's world of cor mercial data processing, it has been easy to overlook the fact that a second company is try-ing to drive into the heart of a

mpetitor's territory. The irony is that the second company is IBM and the competitor, naturally, is DEC.

Some users and most industry observers have been talk-ing about DEC's efforts to profit from certain IBM weakesses, such as poor connectivity in the mid-range processor

One of DEC's stated goals is to increase its presence in commercial DP, particularly in the major corporations that historically have been IBM's best customers. DEC says it is promoting its distributed processing approach for new appli cations rather than trying to th DEC did make a point

# Users evaluate Wang VS 7150

BY ALAN J. RYAN

Users of Wang Laboratories, Inc.'a VS 7150 machine recently said Wang seems to have elimi-nated the kinks in its VS Operating System Release 7 and that the unit runs well, but true peravailable for a number of months.

Wang announced a restruc-turing of the top half of its minicomputer line in mid-January and introduced the VS 7000 series to succeed the VS 85, VS 100 and VS 300 (CW, Jan. 19).

"Speed-wise, [the VS7150] is just like a VS 300 internally," said Phil Dowlin, director of information services at Midcon unit was set up at his company in

offering has doubled the perfor-mance of his VS 100. Midcon, a natural gas pipeline company, continues to run its VS 100 and

three VS 300s. [the VS 7150 is] very stable," claimed Alan Wein, director of information services at insurance agency Cal-Surance Asso-ciates, Inc. in Torrance, Calif. "It took a few days to get the thing

Cal-Surance was not using a Wang installation prior to the

nurchase of the VS 7150, "But all I can say is it is giving us very good response time," Wein com-mented, adding that the unit is not currently being used to its

Although he said he was slightly nervous running the unit's software because of some

um a sortware because of some reputed problems with running Wang's VS Operating System Release 7 on the VS 300, "those haven't been repeated. We're on 7.11, and it's absolutely rock solid "Wale page." id "Wein said.

"Certainly I've heard about unreliability with the 300 operng system, and the [VS 7150] is just a stripped-down 300," Continued on page 51

mode; Flexos 386 uses the 80386 chip's Virtual 86 mode. One of the first implementa-

tions of Flexos will be performed by American Manufacturing Systems, Inc., which is designing a system for controlling factory automation equipment. Current-ly an alpha-test user, the Mait-land, Fla.-based company will combine the operating system with its own 80386-based board and 80186- and 80286-based

single-board computers on an In-tel Multibus II backplane. The firm plans to produce beta units of its system by the end of June, according to Presi-dent Jerry Horn. Priced at less

than \$200,000 for a complete system, the system will be used to orchestrate work cells such as robots and milling machines, he

# M6000 gets growth, power kick

BY JAMES CONNOLLY Douglas Computer Systems Co. has enhanced three of the five

models in its M6000 line of small The three models, introduced in lanuary 1986, were reported ly enhanced to include technol-

models announced in October. The additional features, including a new operating system release, were designed to provide more power and growth capabil-ties while freeing up backplane

The enhanced models are the M6415. M6425 and M6635. The comparable earlier models were the M6310, M6325 and

The upgraded models new level of McDonnell Doug

las's Reality relational data base management-oriented operat Continued on page 51

· AST Research designs a

stand-alone workstation. Page 50. · ADDS introduces entrylevel, Pick-based system.

Page 50. Nemonix unveils Version 2 of its Synchronized Clock Accelerator. Page 54.

# Flexos operates with industrial Intel 80386

BY DAVID BRIGHT MONTEREY, Calif. -- An oper ating system that takes advan-tage of Intel Corp.'s 80386 mi-

tage of intel Corp.'s 80386 mi-croprocessor for industrial applications was released re-cently by Digital Research, Inc. With the latest version of Flexos, Digital Research joins the rush to develop operating systems specifically for the pow-erful 32-bit chip.

Digital Research develop-

Digital Research describes Flexos as a real-time, multitask-ing operating system with the power of Unix and the program-

The Flexos 386 beta release The Flexos 386 beta release is scheduled for distribution in the second quarter. Like the current Flexos 286 version, Flexos 386 will support Intel'a 82786 advanced graphics coprocessor.

Also planned for the two ver-sions of the operating system is an emulation feature for concur-rently running some MS-DOS applications in the processors' tected mode to make realtime applications run more smoothly. With Flexos 286, the

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# Workstation emulates IBM 5250

IRVINE: Calif. - AST Research, Inc. has introduced a workstation based on the Intel Corp. 80286 microprocessor and designed for use as a standalone workstation or in IBM minicomputers.

The AST 5250-Premium/ 286 is said to combine the pro-cessing power of AST's IBM Personal Computer AT-compatible microcomputer with 5250 emulation that enables commu-nication with an IBM System/34. 36 or 38 minicomputer

tecture that operates with zero-wait states, which the company said increases computing speed to 11/2 times that of the PC AT. It can reportedly function as a work or as a cluster controller

supporting Microsoft Corp. MS-DOS personal computers or Dig-ital Equipment Corp. VT100-

terminals and support twi

type terminals. The 5250 emulation of ties are said to include all 32 IBM 5251/11 display and field attributes and up to seven sir neous System/34 through System/38 sessions. It was designed

and remote com The company said the bidirectional file-transfer software

eliminates rekeying errors and enables manipulation of System/ 34 through System/38 data using personal computer software such as Lotus Development Corp.'s 1-2-3. It also supports sus System/34 to System/38 to emulate various IBM display software packages. A hot key allows users to toggle between MS-DOS and System/34 to Sys-

tem/38 sessions. The company said several 5250-Prem 5250-Premium/286 models are available. Options include an AST-5250/Gateway option for a single connection between an IBM Netbios network and a System/34, 36 or 38, an AST 5250/ Cluster Controller option sup-porting up to four additional per-sonal computers and the AST 5250/Async Dial-up option that s a user at a remote site to run 5250 emulation using a standard telephone line and a mo-

The AST 5250-Prer 286 with 1.2M-byte disk drive, a display and twinax emulation costs \$3,095. A 20M-byte ver-sion costs \$3,595.

# ADDS system to support 32 terminals

HAUPPAUGE, N.Y. - Appli Digital Data Systems, Inc. (ADDS), has introduced an en-try-level member to its ADDS Mentor 6000 series of 32-bit multiuser systems.

The company said the Model 2 is designed to support 32 ter-minals and printers while using the same architecture of ADDS's larger Models 4, 6 and 8. "This news t member of the

This newest member of the mily packs a powerful price/ erformance punch, making it an ideal solution in a decentralized office environment where large amounts of processing power serving up to 32 users is a re-quirement," said Robin White, vice-president and general manager of ADDS's Systems Divi-

'Its target market consists of fast-growing small businesses which demand sophisticated computing power now and ex-pandability for the future," White continued.

It runs the Mentor Operating stem. ADDS's enhanced implementation of the Pick Systems, Inc. Pick operating system and uses a Motorola, Inc. 68020

microprocessor.

The basic configuration in-cludes an 85M-byte disk drive, a cartridge tape drive, 1M byte of memory, eight serial ports, one parallel printer port and a con-sole terminal. That configuration costs \$24,000



# IBM enters

of offering its multiple-CPU VAX 8974

and 8978 high-end systems as alternatives to traditional mainframes.

The severity of the DEC-vs.-IBM controntation came to light in bronest observations made by a couple of minagers of combined DEC/IBM compater rerations who were interviewed after the 8974 and 8978 were introduced. Each manager runs DEC equipment on the

manager runs 29 to were ancounced. Issue manager runs DEC equipment on the scientific/engineering side of his shop and IBM gear is his commercial operations. Asked if they had noticed increased efforts by DEC sales agent so the IBM side, the managers expressed surprise. The reverse is true, they said if The real sales push they see is IBM's drive into the technical communities trens, the wreal in

the technical computing arens, the area in which DEC built its reputation. The managers acknowledged their circumstances might prove exceptional if it turns out that they happen to be in geographic areas where DEC has not yet beefed up or stimulated its sales force.

Putting in overtime

Those managers said IBM has been working overtime to promote its 4381 small mainframes and 9370 mid-range system as technical computers. They noticed the continuing emphasis IBM has

### Users evaluate

CONTINUED FROM PAGE 49
Wein admitted. "I had some concern that

we would have some reliability problems, but that a not been proven. I've been very pleased. "Cal-Surance is using Wang's local-area network, Wangnet, to connect the VS

network. Wangenet, to connect the VS 7150 with 20 users. "That's been working fine also," Wein noted. Once the company implements a Wang-based imurance agency package from Harte Systems, Inc., in Oak Brook, Ill., the number of users will jump to more than 70, Wein sald. That is expected to happen by May.

expected to mappen my map.

Cal-Surrance is currently using the unit with Wang WP Plus and Wang Office for program development, implementation and training activities.

At Midcon, the VS 7150 is used as an

executive system, Dowlin explained. "It's the one that all the managers, directors and up to the president of the company are all tied into with the management software that they access."

Middon uses the VS 7150 to track con-

minorituses use \*37.150 to track contracts, points, calculation of supply, planning and sales and delivery, Dowlin said. Midcon follows all of the production data on some \$50,000 oil and gas wells each month.

month.
Dowlin said his VS 7150 is connected,
via an IBM SNA network, to an IBM
SNA network, to an IBM
SNA network, to an IBM
SNA network, to an IBM
Corp. 8000, two Digital Equipment Corp.
minicomputer units — including a VAX
— and a Concurrent Computer Corp.
minicomputer, There are 90 Wang work
stations tied into the VS 7150 and 700

seasons seed into the '45 / 150 And 700 workstations connected to the network. While an upgrade of the machine would require only a box swap and there would be no problem with the software. "I doubt I'd upgrade." Dowlin said, because his select group of users must have access to data quickly. "I'm not going to load that machine down with users."

placed on technical computing in every 3090 mainframe announcement.

3090 mainframe announcement. Much of that promotion has been related to the 3090's vector facility, which lets customers serve commercial and technical users with a single mainframe rather than making them buy separate superminicomputers, such as VAXs, for basic engineering and scientific applica-

tions. That strategy fits with what IBM tried to do more than 20 years ago when it developed its 360 mainframe, providing the first single architecture for commercial and technical application

for commercial and technical application.
Nobody expects IBM and DEC to
trade places. One will not see IBM abandoning the commercial DP market, and
DEC will not leave the technical market,
but it could be interesting during the next year or so to see how the companies

offset lost accounts in each market. It also raises the concern that DEC, with fewer resources than IBM, may insult its longitume technical users by paying too much attention to the IBM-dominated commercial market. Similarly, IBM cannot take for granted the loyality of what some call "all Blase". MIS shops, which have accepted enough DEC equipment already to make IBM executives.

which have accepted enough DEC equiment already to make IBM executives take notice. Those executives cared enough to bring 500 MIS executives to Florida recently for the most highpowered briefing session IBM has offered.

Consolly is Computerworld'assessor editor, systems & peopherals.

### M6000

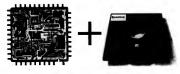
CONTINUED FROM PAGE 49

system, which is based on Pick Systems Pick operating system. Like the models they replace, the en-

Like the models they replace, the enhanced systems are said to support between 512K and 1M bytes of memory. The M6415 and M642S reportedly support up to 225M bytes of disk storage, and the M6635 is available with up to 485M bytes of disk storage, Ports supported a range of 16 on the M6415 to 48 on the M6635.

Prices of the enhanced systems, which range from \$26,000 to \$41,000, are the same as they were for the comparable earlier models.

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# A FEW GOOD NAMES THAT

CTRONICS CENTER COMMERCIAL UNION INSURANCE GILLETTE CANADA. INC DWIDE EXPRESS LEVI STRAUSS & COMPANY HBO & CO. A.C. NIELSEN COMPUT ISION HAMILTON OIL CORPORATION DIALOG INFORMATION SERVICES INC. AE RATION EPRI SOUTHERN COMPANY SERVICES, INC. THE UNIVERSITY OF FLECTR AL ECONOMIC SERVICES BERKEY PHOTO HARRIS GRAPHICS ARAMCO SERVICES ES RAYCHEM CORPORATION FIRST COMPUTER SERVICES, INC. TECHNOLOGIES, I MANAGEMENT TEKTRONIX VERSATEC NIELSEN RECHERCHES MARKETING PO DRPORATION GREAT WESTERN SAVINGS LOMA LINDA UNIVERSITY SECURITY P E DE CONS TONS TE TESORO PETROLFI " 'SEN RECHER N BURNS ( 'E CORP. HE' ting ser TES IC IN DMAN SF SEIDM PARTON RONICS JNIVŁ OF MIN N MAINE TF **IORLO** GARDNE. RESTON ZANI M T FRFRF AGNIE F JAI. S PET S EDMON 'UBLIC SCHOOLS B OF AME SE & EL' ONIC NTE MMERCIAL. N INSURANCE GO JT INC. F L DATA CORP. ' & CON Y HRu 'n., TELSEN COL N MILLER INFC TIONI C ES I **AEROPORTS** ARIS COMPI NEODATA SE ES. P E GPA (GR) J DES POP' ∟5 D'ASSURANCE URA CROCKER FSID FF HOME LC ANKS INDISTRIES ER A CENTER CE JN POUR L -LECTR " " CONTINUI QUE VOLUN " UNI INC. RHONE-... JF AME MATIQUE VOLUNTARY HOSPITALS OF AMERICA COMPUTING SERVICES FINAN CURITY PACIFIC NATIONAL BANK STANDARD LIFE ASSURANCE THE UNIVERSIT DE CONSTRUCTIONS TELEPHONIQUES TESORO PETROLEUM NIELSEN RECHERC CANTILE BANK BURNS COMPUTING SERVICES HEALTH ONE CORP. PLANNING N ERN NATIONAL LIFE RICHMAN GORDMAN SEIDMAN & SEIDMAN CORPORATIO TY THE UNIVERSITY OF SOUTHERN MAINE FRALSEN HORLOGERIE ELECTRONICS NGINEERS HAWORTH CORPORATION B. DALTON SPARTON ELECTRONICS NATI

# HAVE HELPED US BUILD OURS.

Names of companies who have already tested and proven NOMAD2 superior to any other 4GL/DBMS on the market. Names that read like the Who's Who of the corporate world. Including leaders in virtually every business around

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- vendor is as important as product quality. And when you're evaluating NOMAD2, here are a few important facts to keep in mind.
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- D&B Computing Services

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enhancement of NOMAD2.

• 85% of those who try NOMAD2, buy it.
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clear. We are committed to providing the highest level of customer satisfaction and support. To standing behind our products. To meeting every need of our users. History groves we've fine all that for the commanies on

History proves we've done all that for the companies on this list. We'd like to do it for you, too. NOMAD2, which runs on your mainframe or ours, is

· 150 man years have been invested in the ongoing

another step in the NOMAD evolution that began in 1975. For information, here's another good name to remember. Deborah Cox, D&B Computing Services, 187 Danbury Road, Wilton, CT 06897.

(203) 762-2511. The World's Premier 4GL DBMS

NOMAD2 is a registered trademark of D&B Computing Services. In: NOMAD is a trademark of D&B Computing Services. In:

# N E W

Processors onix, Inc. has armoun Ivac 750 is transparent to sys Clock Accelerator option for the Digital Equipment Corp. VAX 11/750. tem- and application-level soft-

Version 2 provides greater throughput speed. It is a back-plane attachment said to increase the clock speed of the 11/ 750. It incorporates an on-line, off-line switch that enables the

ate the accelerator The Synchronized Clock Ac celerator costs \$8,200. Nemonix, 106 South St. Hopkinton, Mass. 01748.

EMC Corp. has anno 4M-byte and an 8M-byte memory board for the Wang Laboratories, Inc. VS 300 sys-

be designed with 256K-byte random-access memory (RAM) and large-scale integration (VLSI) technology, are compati-ble with all VS 300 systems. Both boards feature a pow light and an activity light for toring main memory-level

The 4M-byte memory board costs \$19,200. The 8M-byte board costs \$38,400. EMC, 171 South St., Hopkin ton, Mass, 01748.

Iverson, Inc. has introduced the Ivac 750, an accelerator card for the Digital Equipment Corp. VAX 11/750. The Ivac 750 is said to improve system speed by providing a new clock that pulses variably, according to the exact time re-

DUCTS quired for each instruction, rath er than a fixed pulse. The accelerator plugs onto the back of the backplane of a VAX 11/750.

According to the vendor, the

ware. It features an on/off to switch for returning the CPU to its standard clock. The Ivac 750 costs \$9,950

Iverson, 850 Auburn Court, emont, Calif. 94539. Aida Corp. has announced

three simulation accelerators: the Personal Simulator Pro-cessor (Persim) Models 1 and 2 and the Software Simulator The Persim Model 1 is said to be capable of simulating up to 64,000 gates at 1 million gate evaluations/sec. The Persim Model 2 can simulate up to 128,000 gates at 2.5 million gate evaluations/sec. Both models are

IBM Personal Computer AT bus-compatible and were designed for use with the Apollo Computer, Inc. DN3000 work-64,000 gates at 20,000 gate evaluations/sec. It is compatible

with any Apollo workstation.

Persim Model 1 costs \$7,500 Persim Model 2 costs \$20,000 Softsim is included with the Aida Design System ta, Suite 342, 3375 Scott Blvd., Santa Clara, Calif. 95054.

Input devices Barcode Industries, Inc. has added a series of bar code readers to its Mindreader product

The bar code readers are said to support IBM 3179, 3180, 3191, 3196 and 5291 terms as well as Digital Equipment Corp.'s VT220 and VT240, Un-isys Corp. UTS-30, AT&T 6300 and 7300, Zenith Data Syste Corp. 148, 150, 151 and 241 and

se Technology, Inc. 50 The readers connect to the terminals as wedges between keyboard and screen. Signals rom the bar code reader er ate input from the keyboard. In put devices that are supported

clude pens, laser scar code budge readers.
The Mindreader line ranges

light pen, to \$2,090 including hand-held laser scanner. Barcode Industries, 17 Barow Road, Great Neck, N.Y.

# Data starage Distributed Logic Corp. (Di-log) has announced the DQ606

floppy disk controller for Digital nent Corp. Microvax, Mi croPDP-11 and LSI-11 systems. The controller is contr a single dual-height board and is compatible with DEC's Mass Storage Control Protocol driver. It is a o compatible with stan

dard RX50 drives and m The DQ606 is said to store stroller specification informa tion in nonvolatile random-ac cess memory. It has an on-board formatter and an 8K-byte buffer. It supports 16-, 18- and 22-bit Q bus addressing in block oonblock memory modes and can inhibit the standard direct mem addressing increment. The DO606 costs \$950

Dilog, P.O. Box 6270, 1555 S. Sinclair St., Ansheim, Calif. EMC Corp. has introduced the

.

Falcon Series of mass storage products for the Hewlett-Pack ard Co. HP 3000 computers.

The Falcon I subsystem is configured with 388M bytes of mass storage. The Falcon II has 776M bytes of storage, Both combine Winchester disk drives with EMC's disk-cache proces ing cards, which feature 4M

es of high-speed cache. Up to six Falcon I subsystems can be combined in a single cabi net for a maximum capacity of 2.3G bytes of storage. Up to four Falcon II subsystems can be boused in one cabinet for a maxi m capacity of 3.1G byte Falcon I is priced at \$12,900, and the Falcon II costs \$23,400. EMC, Natick Industrial Cen-tre, Natick, Mass. 01760.

# Terminals

Burr-Brown Corp. has intro-duced the TM8450, a multifunction microterminal or outa entry application

TM8450 accepts data both manually and through automatic identification interfaces such as

r code wands, laser scan d magnetic stripe readers. The base unit is said to con in price from \$595, including n display and keyboard with 23 keys. It can opera ple display, two 80-cnaractus lines at a time; can send and receive block mode data, and can operate as a troubleshooting

> The TM8450 costs \$795 P.O. Rose 11400 Turson Ariv 85734

### Agintenance

Gen/Comp, Inc. has intro-duced its Model 2042 DMA terface for the Unibus The interface and inter-

processor link is said to emulate the Digital Equipment Corp. DR11-W. DR11-Bor DA11-B In features hardware parity gener ation and checking of transferred data to assure integrity. It pro vides switch-selec memory addressing (DMA) pacing Interface can be selected through the range of 30,000 to 500,000 words/sec.

The Gen/Comp Model 2042 DMA Interface costs \$1,000. An optional op-board opto-isolator for long-line data tran

costs an additional \$500. Gen/Comp, 6 Algor Road, Canton, Mass. 02021

BDT Products, Inc. has intro-duced its DL-500 Emulator, a hardware controller said to allow word processing systems to up-grade from daisywheel printers laser printers.

According to the vendor, the DL-500 provides laser printing s to more there 250,000 stand-slone word processing systems from such com es as Lanier Be ess Prod Inc. and CPT Corp. DL-500 Emulator used on these systems provides system com patibility to laser printers from vendors such as Hewlett-Pack-ard Co., Ricob Corp., Xeron Corp. and Epson America, Inc.

sheet feede The DL-500 is priced from \$1 295 BDT Products, 17152 Arm Ave., Irvine, Calif.

Interleaf, Inc. has announced the LPR-308 and the LPR-326S, two printers compatible with IBM's RT Publishing Soft ware package for the IBM RT Personal Computer.

Both printers feature reso ons of 300 dot/in. The LPR-308 prints 8 page/min and the LPR-326S prints 26 page/min. RT Publishing Software fea-

tures integration of text and graphics and a what-you-see-is hat-you-get display. The LPR-308 costs \$8,000. LPR-326S costs and the

\$25,500. Interleaf, Ten Canal Park. Cambridge, Mass. 02141.





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Now you can get higher speed and higher resolution, together in extremely high style. The WYSEpc 286 goes from "normal" speed to full 10 MHz throttle – 25% faster than a Personal Computer AT—with the touch of a switch. A new lineup of graphics monitors lets you choose exactly the display capability you need. Combine the WYSEpc 286

with the WY-530 monochrome or WY-630 color monitor and get outstanding performance. For enhanced color graphics, move up to the WY-640 EGA monitor. Or, bring CAD and nesktop publishing applications into better focus, price-Wyse and pixel-Wyse, with the new WY-700 high resolution graphics display as shown at left.

With the new WYSEpc 286, you can also choose the keyboard that's the best fit: either the standard AT-style, or the IBM Enhanced PC keyboard. And you get the complete compatibility you should expect in every other way, including more than 350 tested off-the-shelf software packages. Up to 80 Mb of disk storage

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# MICRO TO MAINFRAME





Micro-to-mainframe connectivity won't be complete until users can get information in job-ready form. Real linkage involves solutions, not just technology.





# **Retire Your PC Coax Connection**

The PC-to-host coax connection. She was a good piece of equipment working with coax cable and cluster controllers, but time just passed her by. End users started needing more than simple host access. They also needed their PCs to share resources around the office. That's when local area networks came along to fill the need. LANs are dramatically increasing office productivity through

Also are dramatically increasing order productivity incruigin efficient information management. And Gateways are exploiting LAN versatility by providing cost-effective host communication for PCs and other network devices. Now for thousands of dollars less, LANs and Gateways provide PC-to-PC and PC-to-host communications all without a cluster controller.

winfour a cluster controller.

INS Galeway PC Adapters are engineered around proven INS

SNA 3274 cluster controller enulation. A single INS Cateway PC

Adapter, an all-BM NETBIOS compatible IAAI, inclading Token Ring,
will support up to 32 logical unit sessions. The IAAI allows each PC on
the network to share disks, printers and other resources while the
Cateway allows performance of any host-supported function and
maintains host access.

INS planned on PCs becoming a major component in the development of information systems. We designed our Gateways to be the logical choice in providing the vital link between LANs and maintrames. We also planned on much more—flexibility, simplicity and reliability. We provide free, responsive user assistance and guarantee every INS Gateway PC Adapter (hardware and software) for five years.

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An COT COMMANY

### INSIDE

### 0 & A

Lotus's Maurice Shore Lotus's Maurice Shore discusses application con-nectivity, the current prevalence of simple file transfer and the need for interface flexibility in tools like T-A-C. Page S3.



### Ask the Vendor

Vendors respond to user queries regarding future plans, product capabili-ties and compatibility is-sues. Page S7.

# Vendor Viewpoint

Politics are not not and heavy in the three-party process of link selection. The trick is balancing the priorities of MIS applications, MIS communications and end users.

# State of the Union

Users may have to wait for distributed DBMS net-works to reach their po-tential. Page S14.

### Foreign Exchange Multivendor micro-to-mainframe configuration helps Prudential-Bache clear nearly \$5 billion worth of government bonds daily. Page S17.

Product Chart An easy-reference guid

of micro-to-mainframe link software products. Page

NIOR EDITOR ASSOCIATE EDITOR

The next step is to make extraction of data from mainframes a user-driven. application-oriented process.

# 'HE WOR! ONNECTION



icro-to-mainframe users are beginning to demand solutions. They have had their fill of partial answers in the form of technologies like terminal emulation or file transfer or applications development tools. Now, what they are really looking for is the ability to get the data they need to get their jobs done - when they need it and in the form they need it. Until recently, users appeared to be content with much less. Re-quests usually focused on access to this or that specific data base or the

lity to use the information in this or that pro-ction report without rekeying.

As a result, not many organizations looked at e problem from an organizationwide perspecthe problem from an organizationwide perspec-tive. Application by application, they eventually provided access to the necessary data. Programs were written to do the necessary extraction and to set up subset copies of the production data

How and why micro-to-mainframe implemen-tation stalled for so long has something to do with the technology's evolution as well as with its basic

At the beginning of the micro era — when these machines were still listed on expense vouchers as "office supplies" — stand-alone ap-plications were perfectly sufficient. A small spreadsheet for a local need, a little

word processing for memos, maybe some radi-mentary data bases to support the local sales-men's Christmas lists — these were all we need-

Eventually, though, people began to realize that they could get double duty out of these new boxes — and, incidentally, help to justify the ex-

Adrian is chairman of the microterest Group of the New York PC Users Group and a project ager at a New York brokerage firm.

pense — by using them to enulate terminals.

Then it was discovered that, better yet, some of the terminal enulators actually permitted file transfer, so users could move data from the mainform which introduced the transfer. frame right into their micros

It did not take long for reality to rear its ugly head, however. The files were much too big. Even a few thousand records could tie up the micro for hours. The process was quicker than typ-ing in all the data from reports, and it was less rone to error, but the data usually had to be mas-aged extensively once it was downloaded. There were loads of unnecessary fields, sever

al times too many records, and every time a slightly different set was needed, someone had to start programming a new request or a new way of extracting the necessary data from that big mo-

Well, we have certainly progressed beyond that now, haven't we? Surprisingly, the answer is

Even in large companies that have invested heavily in micro-to-mainframe technology, links are often used for nothing more than simple file

The reason for this gap between need and ac-tual use is a lack of understanding about what mi-cro-to-mainframe links are and what they can do. Precisely because these products tend to fall

### Connection FROM PREVIOUS PAGE

between two well-developed bodies of expertise that are generally mutually exclusive, a full view of the issues is rare.

view of the issues is rare.

A major personal computeroriented publication, for example, recently presented a coverstory on micro-to-mainfrante

Were there reviews of vendos-specific lists from fourthgeneration language vendos, products capable of using mainrame storage for micro data accessed as virtual floopy disks or generalized link packages that permit-data extraction from a variety of different file formats for transfer to the PC?

transfer to the PC?

No. The article was exclusively about terminal emulation

boards.

It would be easy to blame the problem on poor media coverage, but it would not be accurate. Several PC oriented magazines have done extensive reviews and product comparisons. The mainframe publications have also

one their part. that has been used throughout Put more precisely, the probm is that each publication has a writer module from the mainthrent emphasis.

### Growing significance There are a number of rea

that the micro-to-mainframe isuse in becoming increasingly significant. These reasons include the following: the growing number of micros in major firms. the 1 around the micro products that have become analytical standards, such as Lotus Development Corp. 'a 1-5-3 and Aluton-Tack of Dause finely: and the contaming decentralization of puring taken below the contract of Dause finely: and the puring taken below to local-area puring taken both or local-area networks (LAN) and minicomputers and soon the new IBM

puters and soon the new IBM 9370s.

As the demand for micro-tomuniframe products has heated up, vendor after vendor has provided micro support, links or

stand-alone packages.

This is especially true in the market for information center products.

Fourth-generation languages, sophisticated graphics and statistical analysis, financial modeling and so forth have been nervided.

Heavy involvement The fourth-generation-language vendors have been heavily involved in the early stages of this

delivery.

One by one, these vendors have created, with varying degrees of success, products that permit the users of their data base management systems and graphics or modeling tools to access and use the data on microcess and use the data on micro-

A good example of this is Information Builders, Inc. product is far and away the dominant fourth-generation lan-

Installed in 46% of the information centers that use a fourthengeneration language, Focus runs full CMS environments; on Digital Equipment Corp. VAXx; Wang m-Laboratories, Inc. VS hardware

and on AT&T's 3B series under the Unix.

Information Builders' PC/
n-Pocus was the first, and is still the most complete, implementas, tion of a mainframe fourth-generation language on a PC.

the most complete, implementation of a mainframe fourth-generation language on a PC. Currently, it is in Release 2.0, and part of the continuing effort to opgrade the product has been the extension of its micro-tomainframe capabilities.

Incorporates defe occess
in December, Information Builders took a totally different tack
with its marketing with the introduction of the Focus Data
Connection.
This product, which is essentially the communications piece
of PC/Focus, incorporates the
measu-driven Talk technology
that has been used throughout

Writer module from the mainframe product.

Perhaps most significantly,
Focus Data Connection incorporates the various interfaces to other file architectures that Information Builders has continually offered and added to with

ually offered and added to with its maintrame product.

The significance of all this is that Information Builders has decided to target another market: the users who may not want or need Focus in its complete form but who do need a general data access method, standard infection and face and the ability to move data to the personal conguter in a form readily usable by micro an-

The company's success with that exact set of features in its own user commantly led it to believe that a significant market was out there for similar capabilities in non-Focus shops. Soll orus in its market and lo-

So Lotus in its market, and Information Builders in its, both perceived a ground swell of demand for data extraction and movement and reformatting that was not being met by current products. These features define the

core product that is now being day sought by users (see story this page).

Sometimes of the story than a see that the story that the stor

Continued on tope \$4

ers getting this from anyone today?
What is being delivered today is a bewildering array of products from all sorts of vendors.
To make sense of it all, it is useful to categorize the many efforts that have and are being made, utilizing two broad case-

# Data exchange today: It's not just PCs and mainframes anymore

There is a persistent tendency to define micro-to-mainframe products as boards that enulate terminals in an IBM 3270 environment. In fact, the reality is far broader. What is more, rudimentary file transfer canobilities are

only one part of the job description.

First, let us dispense with the idea that personal computers and mainframes are the sole compoments of today's computing environment.

Vastly more complex configurations — involving minis and mainfrances from several manufacturers, protocol converters for asynchronous access, localarea networks and more — are needed to satisfy current information accessory.

mation exchange requirements.

Data exchange between
CPUs may also be involved if PCs
emulating terminals on one vendor's system need data residing
on a different vendor's mainframe.

These are not simple problems, but they are not insuperable either, and they are just as good an example of workstationcentered data access as an IBM Personal Computer with a Digial Communications Associates, Inc. Irma board communicating with an IBM mainframe running MVS. Micro-to-mainframe links are near the end of their run as an

ti issue. They will increasingly be subsumed by workstaton data in links.

I just what are the components of a workstation data link? They may be conveniently broken down into three parts that represent the major steps in utilizing the link: data extraction, data movement and data restructural.

These pieces correspond to the three hardware and software environments involved in the link: the musicariams source data structure, the communications network and the workstation.

Data extraction involves far and morber of issues that have

member of issues that have plagued information centers revolve around this process. Obvious ones are access, integrity of data and physical availability. Consider the following: I have security access rights to a file. There it providing myself and oth-

Even if providing myself and other micro users with that access did not in some way compromise the integrity of that data — for example, by permitting the accidental upload of model data into a production file — if may still turn out that the data is not even available conline.

The data might, for example, to be in a generation data group on artape, which means that the typical micro user may not have the

tools or the skill to arrange to have the tape mounted. In fact, the user may not even know how to identify the particular tape at T

Even if it is assumed that all these problems are solved, however, a serious issue remains: What am I going to do with a typical production file that may run into the millions of records and that may be in a format for which I have no ready access method available.

For example, how can I get
d data out of a VSAM file, an IMS
or an Information Builders, Inc.
Focus data base or get the 1,200
records I specifically need from a
six-million-record flat file structure! Data extraction deals with

HE characteristics of the data
link are, or
should be, speed, accuracy, generality and
transparency.

First, of course, data extrace to iton must provide ready and unidentical provide ready and unidentical provide ready and unidentical provide ready and unidentification of the first provide defrom the DP staff every time I to
meet a newly defined data subiset, I am going to run into the
same applications loading that
micro-to-ministrame products as
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ements are needed.

Second, data extraction must
permit selective or conditional
retrieval of the required elements based on some logical
screening — for example, state
equals Utah — or computation
— for example, total sales for
the region is greater than
\$10,000. Note that the computation may not be possible until
retrieval time. In the regional

sales example, the sales may not be summarized by region until I commarized by region until I commarize them as part of the extraction process itself. The product must permit this kind of dynamic postretrieval, pre-coupts electron capability. Third, the data extraction component should pass the data to the list with definition information built in one as to facilitate

processing across the link itself the as well as at the micro end. The same and the micro end the decompressed wherever possible. Transfer rates being what they may are, even carefully optimized for queries can take a long time to by:

dred records are transferred.

Data movement should be relatively hardware independent.

That is, it should be viable to use Irma boards, IBM boards, modems with various software packages and so on with the

It also follows that the interfice should be stable throughout
these environments. Other than
the setting parameters in an asynchronous world where they are
required, the user should on
have to do anything different if a
the plemented. The characteristics
to
the data link are, or should be,
seed, scoursey, generality and

in transparency,

ith The custom wiring of communications protocols for a specific
specification may be very satisfying for those involved and might
even optimise the purticular, but in the long
creates a need for continual intimes the continual in
incommendation in the continual

Furthermore, the acquisition of new technologies, like X.25 or satellite links, imposes a devel-a.

a proposed burden better borne by let the committed to support-bing the users who are paying them for their services.

Data restructuring is a fairly simple process, yet one that has not received sufficient attention of from link vendors. Certainly the improved import capabilities of the current micro packages make it more simple than ever to take data coming in and modd at

But why should the micro users need to do that still? The difference between puting some financial data into comma-separated variable form or putting in the same data into Lous. WK1 form, for example, is utterly trivial to the mainframe but significant that the same data into Lous. Significant that the same data into Lous. WK1 form, for example, is utterly trivial to the mainframe but significant that the same significant that the

For the user, mastering the particular import commands is a waste of time. The user should be able to said for data and have it as easily as if the data were all ready on the hard disk. Obvious ly, transfer time itself is a limit ing factor in the ease of use, but it the data is already etructured the user may never have to leave the application software.

The goal of data restructuring

is to present the extracted information to the application in the form it can most easily, efficiently and transparently use. MERV ADRIAN

# INTERVIEW NEW STYLE INTERFACING

membered as the year Lotus De-velopment Corp. shook off the "one-product-company" image for good. Amid a host of acquisitions and new product releas the company moved strongly into a number of areas, some more successfully than others. In September, The Applica-on Connection (T-A-C), anounced in June, began shipping. T-A-C consists of software at both the micro and mainframe ends that is designed to extract, of it. The No. 1 request by far

manipulate and transfer data be-tween devices and to format it ropriately with the software he other end. Maurice Shore, product manager for Lotus, recently spoke about the product with Merv DB2 is on schedule. Right now

Can you categorize pur chase responses to T-A-C? It's running to our expectations mber, we shipped in Sep-er, so the typical evaluation cycle is ending now for the first

all fourthent syst ered some very interesting trends. First of all, it's astonishing how widespread the Focus from Information Builders, Inc. plus SAS from SAS Institute. Inc. combination is. In fact, the "plus SAS" [option] itself is extremely widespread. Another interesting thing we've noticed is that, despite the wide availability of micro-to-mainframe products.

these products are in-house, the number of people doing straight ally Cobol code written by the

No. I've been very surprised at how little we've come under critm for not providing direct figes to production. We exicism for not providing direct bridges to production. We ex-pected it to be much more of an obstacle. The shops we're talk-ing to are already using the fourth-generation languages for access to that data, and, by and large, they're doing a very good

You've committed to an IBM DB2 interface seen. Is that on schedule, and do you expect to tackle VSAM after that?

we're testing it internally. I can't talk about plans we haven't an-Can you speak about your philosophy regarding the structure of micro-tocome critical.

formation center into a purely batch or on-line mode. It's preferable to give users the option select the mode in which they create the extract program to execute on their machine - online, background batch or fore-ground batch submission. Some ms, with limited use and a high amount of available million instructions per second, want to stay in the on-line environment. Others want to submit queries to batch and store the responses for ng. Our direction is

al computer sid

I can't really talk about any spe-

ate, you've been in cations package in use. Do you see a need for Latus to get into the link piece iter for or

k- Let's say this: It certainly mak sense to have a highly integrated offering available as long as we don't twist the arms of our cuswho have already tomers communications strategy. Most of them bave, so our priority is to

PC interfece. Yes, although there's nothing there yet. But let's go a little furters are trying to do for their end users, you could say they're building toolboxes to fit user needs. That translates into buying patterns. In order to ac-commodate their budgets, they aild based on priorities. What endors have to do is to be intelligent in unbundling the products permit the custo mers to get at the pieces they need as they be-

Let me make another comment here. Some people are coming to us and saying, want to use your data tran protocol, can you let us have the specifications?" For one reason or another, they don't want or our complete product We're trying to work with re-quests like these as much as possible because we're interested in standards too, and of course we wouldn't mind it a bit if our archi-tecture qualified. That's another example of intelligent unbun-

I'd like to turn to the micro side briefly before we close. At the rollout of the product, you had a Lotus 1-2-3 interface, a Lotus Sym-phony interface, which is ore has been some press out you and Microrim out you and Microrim rking on on R:base ce. Can you talk about

In the same spirit that we look at dard transfer formats, we've considered it essential to get other products to work with T-A-C d it is to be as successful as we want it to be. Our intent is, as much as possible, to work with

at yet?

other micro product vendors to help them build their own interface to T-A-C. And yes, a perfect example of this is Microrim's re-lease of R base System V. in module with us that provides us ers with T-A-C integration. An other good example of this would be Ansa (Software Co.'s) interface to us from Paradox. Those products they come from, not like some Lotus-imposed stan-



vendors to help them provide the interfaces themselves in cooper-

A final question: What is your advice to managers avaluating micro-to-main-frame products for possi-ble purchase? Other than buying Lotus, of course. Basically it's this: The critera

for success in micro-to-main frame applications are just the same as they are for the other ap plications you implement and support. The most critical ele-ment of all is to know exactly what you want to do. Every DP manager knows the importance of specs; it's just as true here as it

We get our share of tire kickers, people who just want to do a strategic evaluation of our produ uct. We accommodate them, but the bottom line is that you can't evaluate a product unless you know what you want to do with it. Buyers must be intelligent about identifying real applications where a connectivity prod uct will yield a rate of return worth their investment in it. . .

### Connection FROM PAGE S2

gories: vendor-specific product and generic ones.

Within each category, there are micro- and mainframe-oriented offerings, although, as will soon become apparent, even these distinctions are beginning

Vendor-specific products can be recognized by their close relationship to other products produced by the companies that market them. Some products are offered directly by their micro vendors, as is the case with Lotus's The Application Connection(T-A-C)

Introduced in mid-1986, T-A-Consists of software at both the micro and mainframe end that is designed to extract, manipulate and transfer data between devices and to format it appropriately with the software at the other end.

Group effort Other products are the result of collaborative arrangements, like those Ashton-Tate has forged

HE REAL question here is twofold: One, how transparent is the import? And second, how easy is it to select, sort and reformat exactly the data needed?

with mainframe product vendors.

The latter take the form of

strategic agreements that permit the exchange of technical information, allowing one vendor's products to interface optimally with another's.

Given the dominance of Ashton-Tate's Dhase products in the microcomputer environment, it makes a great deal of sense for the company to seek these agreements, which would permit users of its products to import data after extraction from the mainframe vendor's file archi-

It is less clear, however, whether the mainframe vendors see their best interests being served in this way. If the jonely developed product is their only product offering, it extends the potential use of their products for a chent, if they have links of their own, however, it may compete with their own, however, it may compete with their own link/workstation products.

### sue: The user

The ability to import data is not at issue here; most micro products can handle output that has been created as flat files, especially if delimiters such as commas are used.

In fact, in any major micro

analysis package, the import capabilities are generally robust and easily selected. The real question here is two-

The real question here is twofold: One, how transparent is the import? And second — much more important to micro users with little mainframe expertise — how easy is it to select, sort

and reformat exactly the data needed? These two questions define

dor-specific products, then, really comes down to understanding how much the transparency of data importation depends on the sophistication of the mainframe

access capability.

It is very difficult to create a general data access tool that will permit transparent data extrac-

the principal approaches taken by today's wendors. The firms architectures unless there considering the micro-vendor-specific products, then, realtured in a modular fashion to pertured in a modular fashion to per-

realtured in a modular fashion to permit the development of specific cy of interfaces for those different arnithe the chitectures.

For transparency to be imple-

chitectures.

For transparency to be implemented, the interfaces must hook to a standardized central engine with a consistent user in-

Of the big three micro vendors, only Lotus has recognized and addressed these issues so far. Microsoft Corp. has no product to speak of unless Access is considered, which is only a comrespectively tool.

munications tool.

And Ashton-Tate's products depend on the vendors with whom it develops agreements. Even with these agreements in place, specific stems must be tak-

# IBM Software

DB2: The smart way to get your data...

terface



IBM's Database 2 (DB2) is a data base management system you can relate to. Fast enough to handle most production applications. Yet friendly enough to give users easy access to data.

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And programmers can also be more efficient because of all the supporting software IBM has developed: high level programming languages, program generators and extensive programming tools and aids.

### A User's Dream

What's more, SQL is based on English, which means that users can easily access information in DB2 files, either directly or by means of products like Query Management

vironment, such as logging on, orting the mainframe products needed, performing the extrac-tion and downloading the results. Even where some of this process is automated by the mainframe vendor, there is still either a significant learning curve or the need for extensive and continging DP support for the main-

frame product procedures be-

cause the process is driven from the mainframe end. By contrast, Lotus's ap-

over computing. Alternative strategies Outside of the big three, the strategy depends on using some-one else's product or developing

To date, several other ven dors have opted to work with Lo-

tus, and a number of interfaces are said to be under development proach permits the kind of seam-less interface best suited to endat this time Microrim's new release of R:base System V, which includes

support for T-A-C, is a good exnole of this In a shop where T-A-C is used, creating an environment

ing end-user access from within R-base itself. The menuing as-pects of T-A-C permit development of new queries without DP olvement once interfaces to the necessary files have been

not vendor specific. Answer Systems, a divis Sterling Software, Inc., offers a

There are also micro-orient ed connectivity products that are

product line that includes a general product called Micro/Answer and some tailored versions including Lotus Answer and

Dbase Answer. The strategy that Answer Systems has pursued is one of developing relationships with micro vendors, notably Lotus

and Auhton-Tate Formal agreements these firms have resulted in the ability to create files in the necessary format directly, rather than requiring import processing or reformatting at the micro-

computer end Extensive development of Application Program Interfaces allows processing efficiency to he addressed. Answer Systems products, for example, generally submit batch jobs on the mainframe, freeing up links and the micro resources.

The issue of a se face, a key strength of Lotus's T-A-C, for example, is also addressed by Answer Systems' products. All requests result in the creation of batch jobs for which IBM JCL is automatically

PEN architecture is what makes seamlessness possible. Technology exchange has contributed to a growing ease of use in today's products.

generated. Submission then takes place without direct user involvement

Answer Systems' product line was recently enhanced with the introduction of Answer/Link one of several licensed implementations of Tempus-Link

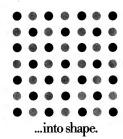
from Micro Tempus, Inc. vendors have offered Tempus-Link, including Pansophic Systems, Inc.

What Tempus-Link pioneer ed is the transparent use of main frame-storage as if it were anoth er disk on the PC, a technology known as virtual floppy disks. This approach facilitates the creation of files specifically for PC users by mainframe production jobs. These jobs can perform extractions and create files as part of the normal overnight batch

By centralizing the location of commonly used production data extracts, the load on the system can be minimized through the provision of a common resource

Tempus-Link continues to be a major and viable product in its own right: there were more than 1,800 installations in mid-1986. Tempus-Link's architecture pinneered the use of servers on the

mainframe and requestors at the echoed by IBM's ECF, a product Continued on next base



Facility (OMF). So users can satisfy their own information needs without adding to the application development backlog. To assist users at every level, DB2 offers extensive online help screens.

### Relational Relations

DR2 data is available to TSO, IMS and CICS users. DB2 was designed to take advantage of IBM's MVS and MVS/XA operating systems, and the multiprocessor architecture and large real storage on IBM systems.

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### Connection FROM PREVIOUS PAGE

ced in mid-1986. IBM's Server questor Program Interface (SRPI) opates in a similar fashion. Lou Bubala, executive vice-pres

of Innovative Computer Products, Inc. in Indianapolis, the U.S. distributors of Mio Tempus products, points out that pus-Access's Host Application Pro m Interface (HAPI), an extension of the existing Tempus-Access module, has validated even more strongly by area is recent connectivity announcements. What IBM is doing with SRPI," he says, "is virtually identical to what our HAPIs have been doing all along."

In mid-1986, Micro Tempus added a new product. Tempus-Access, which directly addresses the scamlessness issue s-Access is itself a licensed product, Dyl-270 from Dylakor, a division of none other than Sterling Software.

Transparency and seamlessness.
These relationships are Byzantine, to be sure, but they make a very significant point: Open architecture is what makes seamlessness possible. Technology exchange by wendors has contributed to a growing case of use in today's products.
Tempus-Access provides menu access
to mainframe data, allows job submission.

writes data out to Tempus-Link virtual oppy disks and may be invoked as a mem ory-resident program on the micro. A ma-

ior weakness is that it does not create files immediately usable by micro applications such as Lotus' .WKS or Dbase's .DBF wever, this is not necessarily a serious

The creation of a .WKS or .DBF file on the mainframe is certainly a provocative issue, and it pays real benefits in ease of use at the micro end, but it is not an unal loyed blessing. In fact, the addition of all that overhead to micro file formats cre-ates a much larger file and hence vastly increases the amount of time necessary to transfer data, even via coaxial connec-

The architecture used by Lotus for T-A-C, including a minimal transfer data base describing the data in a few records at the top, looks much more attractive in

this light, given that T-A-C handles the importation transparently by reading the transfer data base and processing the data

stically on the micro. It would not be appropriate to move or to the mainframe-oriented packages with out discussing a major development in the communications area. Although it does not fit into the model of a complete link product (see story page S2), the Irmalan product from Digital Communications As-sociates, Inc. (DCA) is highly significant

Let us define our terms here. Of the ree pieces addressed in the functional model, Irmalan concerns itself only with the middle block — the actual communications link. The significance of Irmalan is not that it does a better job of providing rivity but that it provides a conne tivity solution to a whole department by hooking a LAN to the mainframe. This is generally referred to as a gateway, and it is certainly not new with DCA's introduc-

However, at the time of the product's introduction, there were more than 300,000 Irms boards installed. That does not include the installations using products from Forte Come which was acquired by DCA in 1986. That volume itself is significant, because what this is is a standard interface, something ers have grown accustomed to.

Irmalan leverages that familiarity, per-mitting the same interface to be available to LAN users simply by installing hardware in one personal computer — which need not be the file server — and install ing software in whichever workstations d mainframe access up to the limits of the board. If users need more sessions, they install another board. It is that sim ple, providing there are the requisite

mainframe lines and ports available.

To its credit, DCA recognized that, to adequately differentiate the product, it needed more than just another pretty interface. The company included as an op-tion the well-developed Forte Communications graphics capabilities, creating a true workstation product with capabilities far beyond those of IBM's 3279-type ter-

For example, if you are using a 3279 terminal and want to recall an SAS Institute, Inc., SAS/Graph image you have to run SAS again, with all its attendant CPU use - not an easy or inexpensive way of doing things. On the Irmalan All Points Addressable workstation, however, you can store and redisplay the image without

Another development on the DCA front is its recent acquisition of Microstuf, Inc., which created Crosstalk, long a domproduct. Although no information is cur-rently available concerning DCA's posts ble plans for cross-fertilization, one can certainly speculate that it may be looking to forestall the approach of another com-pany, Simware, Inc. Simware's new Sim/ Xier product supports irms boards as well ms, permitting an org have a consistent interface for both asyn-

chronous and hard-wired PCs. VM Personal Computing, Inc. in Dan-bury, Conn., has recently provided terminal emulation board support with its Relay Gold product for similar reasons

What all this points out is that comm ations vendoes have realized the value of a consistent interface just as the appli cations software vendors have

To the degree that software runs on



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cts transparently, as, for sie, T-A-C and Linkware Corp.'s Linkware do, the user is ared yet another set of comds to learn.

No vendor of full micro-to mainframe data access and reforcape wants to force customers to re-vamp their communications

strategy just to use its product. The mainframe-oriented prod-ucts may also be looked at from

the point of view of vendor-specific vs. generic. The issues for cific products in the micro and mainframe spheres

are similar with two exceptions First, there is a major diver ce in approaches to the desk top, and second, while the micro products concentrate on provid ing direct access to a nur drame architectures, the frame vendors try to create one or two general formats on the micro end and rely on the micro packages to take it from

The problem with this ap proach is that unless the vendor es ito com mirro soulveis proc ucts integrated with the overall scheme, as Information Builders and Cullinet Software, Inc. do. the user is forced to take additional steps to get out of the link product, start the micro package and import the data before finally g to do some work

ay not wish to be tied to using inet's Goldengate sprea t component after learning sheet component after learning Lotus's 1-2-3, for example, espe-cially if a large number of analyses have already been devel oped using the latter. This was a factor in Cullinet's release of In fogate, which allows the user to integrate the micro package of sice into the scheme and keep it under the control of a works

For several years, Informa tion Builders has had a complete micro implementation of its mainframe product in PC/Focus and in recent years has added a spreadsheet of its own. There are limits to the product's capa-bilities on the PC, but they are imposed by hardware and oper-

ating system constraints, which may soon be lifted. Vern Sheidler, director of marketing at Information Build ers, says, "We're very excited about the new hardware coming in. The Compaq 386, for exam-ple, runs PC Focus three times faster than an AT, and we're still using the same operating sys

Vendors are coming to market with complete implementa-tions or near clones. like Applied Data Research, Inc.'s Ideal Es-cort or D&B Computing Ser-

es. Inc.'s PC Nomad. The goal of these products is not only communica Continued on page S9

### ASK THE VENDOR

The following questions were solicited from users and conveyed to the vendors for responses.

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Ç, stems analys

Cedar Sinas Medical Ces Los Angeles ON LINE SOFTWARE INTERNATION AL. INC.: It is our intention to in-corporate into a future release of mulink a powerful generic Ap-lication Program Interface plication Program Interface This interface will allow a user written application program on the PC to invoke most of Omnilink's host functions. The user program could be written using any of the most come

ages. For users not wishing to

code s program, a powerful script language will be provided. In addition to controlling Omnilink functions, this Appli tion Program Interface will all user programs to interact with er mainf rame system. The PC program will have direct interaction with mainframe screen images. No changes to the user programs will be neces-sury to support different commu-

What are VM Personal computing's plans regard-ng a network version of elay Gold? Would such a n ollow users to get IBM 3270 screen se personal con ch personal computer rve its awn 3270 emula-

n card? Could users re-Rich Hoffman

nior programmer/analyst Data Resources, Inc. Lexington, Mass VM PERSONAL COMPUTING, INC.: A network version of Relay Gold will be available this June. Our mainframe software, Relay!

3270, allows PCs running Relay Gold to emulate a 3270 termina hout any emulation boards at all. So each PC on a network run-Relay Gold will be able to do 3270 emulation without a 3270 emulation board if it is connected to a mainframe running Relay/

We are in the process of developing a mainframe program that will make this hardwarefree 3270 emulation possible for Relay Gold PCs connected to MVS/TSO maintrames. Error free file transfer will also still be sible when connected to mainframes running Relay/ 3270, Relay/VM and Relay/ TSO. You can do this error-free

transfer through 3270 emul tion boards and protocol converters as well

> low soon will Linkwe ive IBM Personal Comp or users full Digital Equi nent Corp. VT240 emu lon in 132-column mo h DEC Regis gra

nager of end-user services General Electric Lighting Business Group

Cleveland

LINKWARE CORP: Linkware now beta-testing full DEC VT220 ter. and emulation. Initially, Linkware VT220 term sistion will display 132 col-as on 80-column screens using horizontal scrolling or 132-column screens that use the Tseng Laboratories, Inc. video display board. Availability is slatr the second quarter.

Full VT240 graphics term Full V1240 graphics terminal emulation, including 132-column and Regis graphics support, is under development and planned for third-quarter release. Link-ware V1240 terminal emulation will support the IBM Enhanced Graphics Adapter and Tang dis-play hardware. Market demand will dictate support for oth

We'd like to stress that these are our current plans and not ents to product re leases, as we have not form announced either product.

gram to take advantage of the expanded memorie available in personal com-puters? Does Tangran nel co of Corp. Windows? And re there cay plans to ofer o program generator nat would allow users to

> Roland Ebright nager, lecknical services Scientific Atlanta, Inc.

TANGRAM SYSTEMS CORP. The PC component of Arbiter requ less than 32K bytes of resident memory for most connectivity options. Since the majority of this memory usage is for executable code, it is not advisable to migrate Arbiter into expanded memory. However, Arbiter allows the user to allocate segments of memory as a cache for

data being transmitted between the host and PC. This cache is a candidate and will be nugrated to expanded memory in a future nce release of Arbiter. In Arbiter's PC component the menu and control functions are bound together. We are cur-

ware employees are curren using prototype software that provides seven-color connect

SIM PC has DEC VT100 em slation as a feature in its current release. We plan to significantly enhance SIM PC's support for non-IBM hosts to allow users full functionality

nent to segregate these func-tions. When accomplished, users in the pro can integrate Arbiter into Windows or IBM Topview applications. Tangram is currently so-liciting customer dislogue to determine the degree of integra-tion into these products that is needed. The reorganization is scheduled for completion by

We will release PC and hos application program interfaces (API) to several beta-test sites by April. These APIs will allow lications running under IBM CICS and PC programs to

communicate on a peer-to-peer basis via Arbiter's LU6.2 interface. Arbiter will provide peer-to-peer functions even for PCs using asynchronous and IBM 3270 emulation — coax or IBM Synchronous Data Link Control onnectivity options. We an ite production availability ring the second quarter

r pro

3278 and 3279 Corp. hosts? Marty Goldberg

Senior systems analysi Chevron Information Technology Co. San Ramon, Calif. SDIWARE, INC. It is one of Sim

ware's goals to provide sality in its approach to PC-mainframe integration. This goal includes all of the features mentioned in your question. Simware currently neo full-featured support for both co

axial and asynchronous co nications in SIM 3278/PC in combination with its sister prod uct, Sim/Xier. LAN interconnect is of particar strategic interest to Sini

ware. Research is under way for this aspect of connectivity. Simware is committed to pro viding extended color, and devel coment is under way. Some Sim-

coss of inst umber of Digital Eq nt Carp. VAX2 bot guerters of ns does OBS have fo iting o VAX version of

John Petrusk Microsystems analysi Allegheny International, Inc. Pittsburgh

ORS SOFTWARE ORS has b studying the impact of DEC VAX support in both our software products and remote computing service businesses. While our just-released Version 3.2 of Excellink is focused on emprove-ments for the IBM user, we are considering DEC VT100 emula tion and a suitable file transfer protocol for the DEC environ-ment for our next Excellink re-

Jeff Sorenses State of South Dakote

INNOVATIVE COMPUTER PROFE UCTS: Tempus-Access, devel oped by Micro Tempus, Inc., has been designed to support a wide variety of data bases commonly found in the corporate environ

Tempus-Access uses methods for this compatibuty: direct reads to files and data bases and call facilities to data bases that support direct calls. Currently, Tempus-Access offers direct read interfaces to sequential, ISAM, BDAM and

VSAM files as well as to IBM's IMS DI Land Collinet Software Inc.'s IDMS and IDMS/R as op-I product features. Tempus Access

both a call and user ext lachts for user routines to interface with most other data bases such as Adabas. Natural, Applied Data Research, Inc.'s Datacom/DB, Total and others that support

these calls. The future direction is to create direct interfaces with date bases that are in line with market demand such as IBM's DB2

# VENDOR VIEWPOINT Link politics and the art of compromise

BY IACK RODGERS

Micro-to-mainframe departmental politics is a three-party sys-tem involving MIS applications management, end users and MIS munications Companies face common political problems and obstacles evaluating, select ing and implementing a micro-to-

ame link A successful integration of personal computers into the mainframe environment must take into consideration anterde ental needs and the balance of power. Political problems can be overcome or avoided completely if a company takes the right approach.

In most areas of corporate game playing, the well-known and generally accepted rules of the game provide guidelines to resolve conflicts. However, the micro-to-mainframe link game is new, and as yet, it has no rules.

The first step in building the ight approach to micro-to-r nk integration is to understand the special interests of each party involved, MIS applications management wants to minimize the impact of the link on system response time. The extent of that impact depends on how large the files are and how often they are transferred as well as how many users are on the system at one time. But even if the initial work load is acceptahlè, link usage tends to grow

End users are application ori-ented. To them, important issues are ease of use, speed and functionality. End-user departents may have significantly difrent needs, however, as well as different definitions for those terms MIS communications is a port function to MIS applications management, but the mucro-to-mainframe link issue u duces a new element into the

MIS communications plays a dominant role in the link process: It becomes judge, jury and traffic cop between MIS applications management and end users. nce the link must be compatible with the existing and planned network hardware and software, perned with issues such as the mber of asynchronous ports,

al-up vs. local communicat and protocol converters deed for finger speed, not line

Rodgers has 16 years experience in MIS management and applications devel nament. He is director of marketing OBS Software, a division of On-Line ns Systems, Inc. is San Francis

End users may not understand data communications, and MIS applications management may not be fully aware of the lim its of the network, but MIS cor munications has to understand

them both Satisfying the needs of each flict arises when the needs of one party are sacrificed to meet the ds of another. Further, the needs do not even stay the same - this is a moving-target prob

lem. During the typical require ment of six months to a year for micro-to-mainframe link inte olves, and conflict evolves withit

Not only does the comm cations network change, but perchanges also. ome cases, the responsi-

bility for the link mitches from one player to another The evaluawhich reviewscreen

er maintained. products to select 2 few of them for further conis chancy when delegated to an mexperienced user. A negative or prolonged evaluation may result because the user cannot get the micro-to-mainframe link to work. The link might be errone ously dropped before MIS be

es involved, thereby une tentionally avoiding conflict before it begins. The political clie ly heat up, however, when MIS does not involve end users in tion and selection at all. MIS may do this either be

se these tasks are perceived to be MIS functions. A common failing here is neglect ing to stress-test the micro-to drame link to consider the end-user volume demand. If the link performs well during testing but bogs down in production, it is too late to avoid a finger-pointing conflict. Either the link is replaced or the use of the existing k is restricted

How severe this restriction on use can be is illustrated by a Houston oil company. The compeny, currently seeking a recement for its CICS-based micro-to-mainframe link, specified this policy: The link cannot be used in production until after 10

The potential for conflict is greatly increased if a company uses different hardware vendors at different levels. At one large packaged good company based in Cincil

MIS favored the use of IBM ucts, which was a standa in the MIS department. Enduser departments had Apple uter, Inc. machines a Digital Research, Inc. CP/M based computers. The conflict arose because MIS and endusers had not agreed upon a standard

In this case, the link selected supported all three types of com puters, but subsequent enhance-ments for the Apple and CP/M machines had to be limited.

And now a new conflict rages about micro-to-mainframe lis support of IBM vs. non-IBM

The recent news of Intel Corp. 80386-N THE threeparty micro-tobased IBM mimainframe link crocomouters. political system, interdepartmental needs IBM Personal must be acknowledged

Computers, indicates hard and a balance of powstan dards will be a ce of confi Not only MIS and end users need to be satisfied. MIS com-

munications also has to determine which micro-to-mainframe link solutions are feasible, given e communications network. In all of the above examples, feasi ble micro-to-mainframe link sobutions that could be supported by the communications network were not practical. In another situation, MIS

nmunications for a Southern California aerospace company red that the link support a specific IBM protocol converter and run transparently on an Uo-germann-Bass, Inc. local-area cause users do not have time or twork. Any product that did criteria could not even be considered, regardless of the needs ex saed by the other parti The conflict was resolu

when the end users accepted the situtions of the data communi MIS communications is in direct conflict with end users on the use of autologon scripts. The script feature of micro-to-main-

frame links enables end users to complete complex communica tions and transfers with a simple sometimes even a one-key interface. However, using these rame or eatures means revam way that the ma logon process is managed, he



use the frequent changes that MIS communications often makes in logon procedures

Because the benefits of an autologon are significant and the not made impossible — it is only made more difficult — MIS comons usually loses this

Micro-to-mainframe link imlementation typically begins with the purchase of a minimum configuration. In a successful in-tegration, the link usually expands and the company chases a site license. If the n of each party are not met, how-

ever, the link stagnates and is eventually replaced. Another common cause for stagnation is the hands-in-pock et standoff that occurs when pay nent is mentioned. The real ems do not occur at the out-

set, when end users usually pay if the link is primarily a micro link or when MIS pays if the link re-sides on a mainframe. It is when use of this technology is going to spread, though, that rules must be in place to govern how the ad-ditional usage is financed.

Three-way communication In the three-party micro-to-mainframe link political system. interdepartmental needs must be acknowledged and a balance of power maintained for success-ful integration. If one party dominates, the wrong link may be

well-defined technical veto role but should not otherwise bias the decision. If MIS applications management dominates in the evaluation and selection phases, problems may surface during im-plementation. If MIS passively accepts the link selection as a service bureau, the result may be less than optimal, however, since vocal end users may satisfy

their needs at the expense of oth-er end users or the MIS applicap. Even the best inteoons group. Even the some to their own devices, might select something that meets to-day's needs but not tomorrow's.

ing company provides an exam ple of what can result from an un balanced selection process. In this company, the MIS group wound up purchasing a second link product to replace one selected and used by the informa on center but which was dis liked by a coalition of MIS and some end users. The information center, at first reluctant, eventu ally accepted the new link after a six-month learning and adapta-

tion period The task force has been found to be the most successful ap-nessed to micro-to-mainframe integration. Representatives from each party form a steering committee to inventory the needs requirements. This inven tory evolves into a request for proposal (RFP) for vendors. The coequal committee structure maintains a halance of nower. The RFP murantees that the in

A New England state agency recently used the task force approach in a successful micro-to mainframe integration. The oeeds and priorities of every party formed the found tion for a comprehensive RFP issued to

But having an RFP does not guarantee that the link chosen will satisfy all oreds specified in the RFP. In this case, when the selected link was OBS Software's Excellink product, it did not support all of the required communications hardware. Nor did it satisfy the oeeds of the enduser departments. OBS had to enhance the product within a specified time frame to meet all

The right app vides a good start. Micro-tomainframe integration must be demonity It must earlie over time as the environment and needs within the company

Link technology is o of different evolving compo-nents: file transfer, data management, security, data transforms tion and network topologies. No one product can provide the flexibility and functionality required basis yet, since every change creates the potential for new atterdepartmental conflicts.
Micro-to-mainframe intern

tion must be constructed on a central open-architecture product that integrates the cor nest technologies. In this way, flexibility and functionality can be maintained over time to suc-cessfully deal with movine-tar-

### Connection FROM PAGE ST

es and data exchange, but also applica-es development. Projects can be devel-ed and tested on the micro without tying up mainframe resources at all. The links help prevent duplication of existing modules and can also aid in the creation of test data by subsetting real data and ading it for sime

Even more interesting is the possibility of creating shared processing applica-tions. Local validations and edit checks can precede upload, and download results can determine the direction of continued operations. Still, we are a step or two

Another approach, and one that makes no bones about its mainframe orientation is that of using micros purely as worksta-tions and not as stand-alone development sites. Some examples of this are Software AG of North America, Inc.'s Natural Conction and the Ramis PC Workstation On-Line Software International

The latter is not a micro version of Raare saster as not a micro version of Ra-mis; programs do not run in it, but they may be developed, and queries designed and performed via the mainframe link, with results being downloaded to other packages. All this occurs under the control of a workstation manager that han-

nus and the links. The workstation manager, originally developed separately, has recently been idled into a cohesive and integrated ole by On-Line Software. In this conration, it is far more attractive than the Focus link facility, which supports asynchronous communications by presenting the user with a blank screen and waiting for commands to be entered in the

modem's command language.

This should not be construed as a fatal flaw on the part of PC/Focus or Focus Data Connection, although it is annoying. More to the point for Focus product users More to the point for Focus product users in the huge array of available interfaces to other data structures. IBM's IMS, DB2 and competing vendors' products such as Software AG's Adabas or IDMS, VSAM — can all be read with Focus.

In fact, now that the product re DEC equipment and the micro product supports DEC's VT100, it could actually be used as a bridge between IBM and ble on both.

It is precisely this flexibility that gener-ic vendors seek to achieve, but this partic-ular vendor-specific product has more interfaces than any of them.

All of this makes it fairly obvious wby Information Builders would bring the Fo-cus Data Connection to market. The comeleteness of the Focus report writer - it is widely perceived as one of the best of its kind — the large number of available interfaces, the ability to join dissimilar file architectures together for reporting pur-poses, coupled with a menu-driven front end make this an attractive option for shops that do not need the full Focus prod-

used on interviews with Inform Builders management, one can expect sig-nificant enhancements to the user interface soon. For example, a scripting facili-ty, which remains a major omission, is ted to be released soon.

Competition in the mainframe-orient-ed market is likely to be between Informa-tion Builders and the generic link vendor. No number of features is going to sell a

vendor-specific product to a shop that has multiple products with data to access. That shop could, to be sure, purchase all of the proprietary products, and in the ab-sence of general solutions, some have

Best they weeks use it requires the development of a ops with only one or two mainframe ope will only one or two manufactors ducts to support, they are probably midered only a secondary market to se vendors, and if they stay with their ndor's like product, they will most like-

IBM is a apecial case. It obviously low link products, since it has so many of them. The industry will probably wait a ong time for any kind of general solution this area from Big Blue.

in this area from Big Blue.

There are a number of interesting products to consider: Linkware, a subsidiary of Ungermann-Bass, Inc.; Arbiter from Tangram Systems Corp.; and Excellent and VDAM from OBS Software. However, the fact is that these products do not constitute total solutions to the is-sues-discussed here. Each falls short of the

primary goal of accessing the data needed on the mainframe and extracting just what

Combinations of strength One interesting approach, however, is the combination of two products, Linkware and Carleton Corp.'s CQS-Infotec, Linkware, a premier communications package, can provide an outstanding comm as DEC, MVS, VM and Unix, is poss through commonly used protocols, includ-ing asynchronous and X.25 as well as Systems Network Archit

A nice touch is minicomputer support, an issue we have not discussed here, but one that is highly significant in many large organizations in which minis, more than LANs, are used as departmental solu

The Linkware PC interface is acceptive and very well organized. Data transformations available include direct. WKS conversions and others, and the scripting ows the development of the seamless ofications we have alluded to. What is ng in this product are extensive inframe data access capabilities. Enter rieton with a copy of CQS-Infotec in hand. The previously missing functiona-lity is here, with direct access to VSAM, ISAM, Adabas, IDMS and others.

Carleton has no ownership relationship with Ungermann-Bass, parent of Link-ware, but there is a certain amount of joint marketing. The two products are well integrated and provide a mix of features that would qualify not only as a complete connectivity product, but as an ultra-higherformance one, especially with Link vare'a new VTAM-resident version.

The ontimization of the comink is an area that has received increasingly more attention in the last year creasingly more attention in the last year with the introduction of faster moderns, VTAM-resident links and the like. Driven by increasingly large demands on their systems as well as greater volumes of data per download as the applications themselves become more sophisticated, companies have begun to look for optimal communications arounds.



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### Connection

One example of these is Arb ter from Tangram, a firm formed by some former SAS personnel with a great deal of SNA sophisti-cation. Arbiter is a VTAM-resi-dent application; that is, it byes the telecon

This strategy improves efficiency by removing a layer of over-It is important to note, how-er, that the performance nefits of Arbiter do not be-

come apparent for the first few users. A user of TSO gets a certain amount of memory for a working set, and Arbiter uses more than that. Subsequent TSO users get just as much, however,

while the Arbiter increment is fairly small. The crossover comes at four or five simultaneous sessions. At that point, Ar biter begins to show its advan-

tages,
Even more interesting is Ar-biter's capability of differentiat-ing among the devices to which it interfaces. Instead of simply see-ing a 3270 device, Arbiter knows it is looking at an IBM Personal

Computer XT, at which level of DOS it is running, how many mepabytes of storage it has and so

This is a useful mana teresting ways. tool in terms of resource reporting, and it also has implications with respect to optimizing the link, since the device drivers are different for dissimilar devices ticular machine'a capabiliti

And, of course, with LU6.2 in place, the ability to pass this kind of information back and forth old be used in a variety of in-

teresting ways.

Michael Camp, president of Tangram, says, "It has become obvious to some of the major micro software vendors that they can use the intelligence of the PC for more than file reformatting and directly accessing the host. There is a need to put in layering or messaging software that will allow a user on a PC to kick off tasks which may run on a host or a LAN. The messaging software could more or less act as a traffic cop to receive and distribute the messages, which could be as sim-ple as, 'The batch job is finished' or as complex as reformatting a

Background task functions will be able to integrate with Ad-vanced-Program-to-Program Communications (APPC), an early IBM implementation of LU6.2, as if the protocol were

actionality that APPC pro ises but cannot itself deliver.

In the current release of the product, for example, Arbites can be used to multitask on the inframe: Users can begin an Arbiter session, start a dor load, then begin a TSO sess from the same PC works while the download process

### The future

are likely to be more develop ments than can possibly be cov-ered here. There are, however, me key areas to watch.

First, there is the continuir evolution of SNA. IBM, o course, wants to keep SNA as the standard for the whole computing community, but there is a competing standard in Open Sys-tems Interconnect (OSI) that may make for some interesting

For example, in principle, Linkware could serve as a bridge between systems running the two environments, although that in not possible today, Linkware's parent company, Ungermann-Bass, has been heavily involved in some of the efforts to promulgate the OSI stands

The link and applicat dors are beginning to butt against some issues that are fun-damental to SNA. For example, Information Builders' Sheidler says, "We're all dealing with the is replacing the 3270 terminal. The possibilities of enhancements to user interfaces are buse. In the future, the way that mainframe cycles are used will be very different.

There is a deeper truth her As discussed above, buzzwords like LU6.2, PU2.1 and APPC are only a piece of the picture. John Crocker, executive vice-presi-dent of On-Line Software, points out that "LU6.2 is only a tool. Extensive development must be



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you manning the data center barri-cades, it's time to install Arbiter," and declare peace.

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CICS-orTSO-based link products. Because Arbiter is a VTAM application, there are fewer layers of software between the PC user and the information, saving processoroverhead. Arbiters advanced ta compression scheme also wes valuable network resources. As a subsystem, Arbiter fully supports RACE and other popular supports RACE and other popular supports RACE and other popular supports RACE and the support RACE and the support

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corporate data via remote disks-already formatted for Lotus I-2-37 dBASEI for III for other popular soft ware informats like WKS, DIF or CSV Remote daks are accessed exactly like the disks attached to the PC.

like the disks attached to the PC. Arbiter enables your informa-tion center to extract data from any host-formated file structure (e.g., IMS, DB2 or VSAM) using its existingtools, whether theyle COBOL, Pascal PL/I, SAS® or POCUS®

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devoted to ensuring that the mu-cro end is intelligent enough to

de its duties. The implications of all this are very interesting. First, expect the vendors to remain poised until IBM lets the other shoe drop tal IBM lets the other shoe drop and gives some idea of how APPC services and the SRPI will be provided and supported. The required degree of sophistication virtually ensures that no vendor will bring anything to market that might be obsoleted by the full specification of operati system services that are avail

The possibility of allowing us ers to create their own unique cooperative processing environ-ments is already in the cards, ac-cording to Tangram's Camp. Customers want to build app cations where the PCs propresentation services and con-textual editing," be says, "for example, policy processing for insurance companies. We curinsurance companies. We cur-rently have a client who used to use the typical approach: present all transactions to CICS for edit-

HE GROWTH of distributed processing will not only continue but should take a quantum leap with the availability of these tools.

ing, validation, computation and updates. Using Arbiter, the PC does presentation services and makes conditional decisions for processing [contextual editing] such as prompting for spouse's name if the form indicates 'married' but that field is not filled

It is safe to predict that the growth of distributed processing will not only continue apace, but will not only continue apace, but should take a quantum leap with the availability of these tools and others like them. Consider that a Focus user today could design a true shared processing applica-tion, except for the fact that no ongoing communications car proceed in both directions. While a line can exist between devices, the connection is half-duplex. Until true program-to-program communications arrives, any dis-tributed architecture is too specific to the particular job to rep-resent a real trend.

Nevertheless, serious work

on distributed processing has been done by Relational Technology, vendors of Ingres, and Oracle Corp. vendors of Oracle and others. In addition, Cullinet Software is working on a distrib-uted version of IDMS. As services become available to han r architectur s tra parently, it no longer will matter that a network includes a LAN in Chicago, a 9370 in Detroit and 1,000 salesmen in the field, all of whom rely on the central infor-

mation server machine for the

Jack Armstrong, Cullinet product marketing manager, in-formation center products, has Cullinet believes this kind of information resource, centrally stored and managed and serving diverse needs within a large organization, is the architecture of

the future, regardless of wheth-

er the departmental solution is a LAN or supermicro/small main-frame hardware. For this vision to become reality, the continu evolution of connectivity will be

Builders' Shiedler acknowledges this and notes. "We have established a formal group on connectivity, and we expect to devote considcerns of connectivity and the workstation data link (see story erable resources to it.

This brings us to this question: Is connectivity just another

buzzword or does it represent a new level of functionality I believe the latter is true, and in fact, the micro-to-mainframe issue as it is understood today will not even be an issue two years from now, having been subsumed into the larger con-

page S2).

In a true connectivity environment, even a scenario as outrageous as the following could be functional. A file server that is on a LAN that is connected to a departmental processor connected to a mainframe could provide data to a remote workstation asynchronously communicating another mainframe

Continued on page S19

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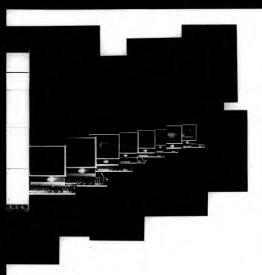
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## Sketches of distributed DBMS

BY STEVE FELDMAN

ce, start with a hetero-

give microcomputer users a sin-gle relational view of all data stored over the entire computer is performance optimization so queries are processed in the most efficient manner across the

Now, add extremely high lev-

day's distributed data base man-agement technology seems very crude. Recent releases of the much-ballyhooed lagres and Or-acle products are really no more concurrency and recovery. This picture includes support of a two-phase commit and rollback protocol to permit synchronized

Compared with this ideal, to-

than preliminary steps.

The industry will probably have to wait at least two years before IBM unveils a networked

DBMS, analysts project.

Meanwhile, Oracle Corp. in Belmont, Calif., with its SQL\*Star and Relational Tech nology, Inc. (RTI) in Alameda Calif., with its Ingres/Star, rep

resent the state of the art in di tributed IBM SQL-based DBM Observers point out, howe er, that the first releases of the es — an extrem chore — and remain ed in performance and in

uncharted waters, and nobody really understands the implica-tions for data base integrity, file recovery and restart recovery," says Michael Braude, vice-presi-

"It took IBM eight years to put backup disk recovery for IMS into place just between two you're talking about any number not even on the same disk. Just in terms of the file and data integration mechanisms that

Today's heterogeneous dis-tributed DBMS products sup-port a distributed read (query) vironment but not a distri ed write (update) environment "Recovery and update mode must be local with the current products," says James Davey, senior research associate at Dig-ital Consulting, Inc. "Vendors don't offer a distributed data base with full location and renli-

vertheless, many, if not most, dications required by today's rs can be satisfied with a tworked DBMS that permits e, Davey notes. Yankee Group analyst Nins

ching algorithms but also complex network tracking is

"she says. puters, Inc. as being the first vendor to deliver highly func-tional distributed DBMS, which evolved as an integral part of Tandem's fault-tolerant archi-tecture. Tandem partitions data

ecus distributed data base els of coordination between data bases residing on individual gement system that snans Make sure this view is trans parent so users can query the system without knowing how or nodes so the entire system functions with global data integrity.

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ally exclusive but collectively exhaustive data base subsets distributed across a network. "That means there is no duplication of data between subsets, which together give a sum total of the data base," Lytton explains. "A user can grow his data base in size just by adding

Oracle and RTI take exception to the picture observers paint of distributed DBMS techpoint of distributed DBMs tecn-nology. For example, Oracle points out the following: • SQL\*Star\* a current support of IBM VM/CMS hosts, Digital Equipment Corp. VAXIVMS,

Equipment Corp. VAX/VMS Unix and IBM's PC-DOS satis lies a major portion of the m

· Oracle's support for a two phase commit protocol for multi-site updating is due this year, along with additional interfaces to non-Oracle products such as IBM's DB2 and ISAM,

 Tandem's distributed DBMS, while homogeneous, demon-strates that data integrity can be preserved in multiupdate envi

OBODY really understands the implications for data base integrity, file recovery and restart recovery."

MICHAELBRAUDE GARTNER GROUP, INC.

· Academic research and IBM's R\* project provide an eno body of work addression of w.cy of work adversing data in-tegrity and recovery." Although this has not been implemented and shipped commercially, we have a good understanding of these issues." these issues," says Ken Cohen. Oracle's product

rector Oracle emphasizes that SQL\*Star is an open system that "faithfully" adheres to IBM's R\* specifications.

"We believe the more un-

charted course is in administra-tive procedures," Cohen says, "which will be needed to manage distributed DBMS."

Oracle points out that its pace for delivering increased func-tionality meets or exceeds users' ability to absorb it. For example, by the time it delivers a two-phase commit protocol, the com-pany says, customers will still be senting applicati plensite updating. Standardization on SQL will

help drive the integration of mainframe and personal comput-er processing and simplify devel-opment of distributed applications. "Every hardware and software vendor is rushing to de-velop SQL data base systems." saya RTI's Robert McCord, project manager for distributed technology, "This will make our job easier, since we will want to

access as many of those SQL en-gines as possible. This will give

atting all our eggs in the Ingres

ket," says Tony megie Mellon's m

RTI has formed a five-year artnership with Carnegie-Mel-on University, which will be imting Ingres/Star over its wide network. "We're

systems development. "We feel that distributed relational sys-tems provide the most capabilities for both developers and querying by the client popula The key thing between the mi-

nframe link is managetween micros and mini and mainment, and we now feel with our distributed DBMS we have the frame data base systems, Ingres on a PC will allow users to access good software to do the manage ment and handshaking." igres data from heterogeneous has just introduced In-

gres on IBM Personal Comput-ers. With this product, data within their popular PC packages such as Lotus Developnetworked PC users can run Ingres applications locally that will cess data residing on minis mainframes in distributed configurations. As a bridge be-

packages such as Lotus Develop-ment Corp. 's 1-2-3.

In addition, Ingres can also run on PCs in stand-alone fash-ion. Ingres will enable PCs to act as full-function fourth-generation application development systems. Applications developed on PCs can be ported without change to run on minis and mainstributed systems and use that mes, according to the firm.



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## Untangling the web of multiple-vendor linkage

An MIS acquaintance recently recounted a dream he'd had. In it, he said, a huge computer corporation seized control of the country, wresting power from the weakened reigns of a scandal-plagu president. As its first order of business the new corporate ruler mandated that only his company's personal computers mainframes, networking and data base management software would be used

oled the man for suffering hrough such a nightmare.
"What nightmare" he responded.
They just solved my micro-to-main

It is true that MIS departments and in tion centers can only dream about a tems from a single vendor. Reality is a rightmarish, tangled web stretching across multiple-vendor hosts, micros, minis, emulation boards, data bases, link software, local-area networks (LAN), pri-vate branch exchanges, public networks

There is some hope for order, howevas General Electric Co. a Lighting Business Group in Cleveland discovered when it set about finding a way to connect Equipment Corp. VAX hosts. What GE discovered was software from Linkware Corp. in Waltham, Mass. Applications running on the hosts create summary data sets stored within Linkware's host-resi dent file servers - staging areas accessed by PCs running Linkware's user

looks exactly the same in the IBM world as it does in the DEC world," says GE's

Steve Gokorsch, manager of end-user services, "We now have a single interface to train people on and support."

By installing Linkware, Gokorsch has been able to eliminate various link prod-ucts previously in use, which, he says, "each worked a different way and were

#### driving us crazy. Support for soulty Linkware, notable for its broad range of

Linkware, notable for its broad range of support spanning multiple-vendor hosts, PCs, local-area networks, asynchronous communications, IBM Systems Network Architecture and IBM 3270 protocol con-verters, was purchased last February by ier Ungermann-Bass, Inc., exependent software vendors combining to address multivendor communi-

For example, with Linkware software an IBM Personal Computer or Apple Computer, Inc. Macintosh user could employ a single menu-driven interface to acof IBM MVS/VTAM, MVS/TSO VM/CMS and System/38 hosts; DEC VAX/VMS computers: Hewlett-Packard Co. HP 3000 systems; and Unix ma chines. Other personal computers sup-ported include the Wang Laboratories Inc. Professional Computer, DEC's Rain-bow and Decmate and Unisys Corp.'s

says large MIS detired of trying to port many di erent link prod ucts to deal with

connecting systems from a single vendor. Reality is a ok information nightmarish, tangled web. centers will not

only simplify train-ing and support, but improve control of in-formation, Benoît stresses. Convincing customers, however, to nmit to a comprehensive strategy in today's cloudy and volatile market is diffi-cult. The challenges Linkware faces in selling its broad link solution may shed

on the state of today's micro-to-The first wall of resistance comes from a market that still underestimates the com-

sities of multivendor micro-to-ma ame communications - and thus, the

want to see me \$25,000 worth or me transfer when I can get Masscomp Co.'s Kermit for free and Microstuf, Inc.'s Crosstalk for a couple of hundred dol-

· Collect and organize summary produc

Supply PC users with a menu interface for automatic host logon, file transfer, data translation, Help and library services

and a script language for automating ter

· Provide tools for programmers to build

distributed multiple-vendor applications. These applications render Linkware the communications glue between disparate

computers and networks; programmers

shelf or custom extraction facilities are used to place data tables in Linkware's

ed little knowledge of come However, Linkware does not pro data base extraction. A user's off-the-

host file servers. For example, an information center und sandwich Linkware communica-ens between Lotus Development

from multiple vendors.

ings of Linkware software, accordworkings of Linkware souware, according to Linkware Marketing Director Norman Saunders, "People say, Why do you want to sell me \$25,000 worth of file

T IS true that MIS

departments and

only dream about a link

strategy as simple as

tion — which provides extraction from a range of popular data bases — and a Lotus PC from and

The less PC users see of Linkware the ster. Artificial Intelligence Corp. (AIC) Waltham, Mass., a Linkware OEM, adds value to its natural language extract capability by embedding Linkware into an offering that downloads results running on a PC. "The end user never sees us." says Linkware Product Support Director John Burns. "But we're providing the network support, the error recovery and the scripting totally transparent to the user. So [AIC] can sell a product like this with-

faces charges that information centers can wide direct access to live production data and that y contain re-

ndant informads by saying that MIS requires first and foremost a manageable environment, ware's architecture provides. ment, which Link-

'MIS doesn't want end user ing through their live applications from a security, integrity and performance standpoint," he says, "And end users just want the piece of information critical to their jobs. Data doesn't reside in one place anymore, but must be cut up and moved to

## The rest of the story Nevertheless, Linkware's file server ar-

chitecture represents just one approach to linking micros and mainframes. Tan-gram Systems Corp. in Cary, N.C., for example, creates a virtual disk on a host, which IBM PC users perceive as a local disk device. The virtual disk is an application running on Tangram's LU6.2-based VTAM subsystem. File transfer is accom-plished by reading from and writing to the

Beyond file transfer, Linkware's mod-ular architecture allows the software to PC users can easily relate to the virtua sk concept and do not have to leave their Linkware provides a clean, simple user intion data in file servers running on hosts terface, PC users must exit their program to invoke Linkware file transfer. Still, both virtual disk and file server approach- Transform data into the appropriate for-mat of the recipient PC application or es have their respective advantages, ob Provide session-layer control, data se-curity, error-checking data integrity and

Claiming 43 of the Fortune 200 as tomers, Linkware says the market for mi-cro-to-mainframe links is split between tactical buyers looking for quick and dirty solutions to solve specific problems and strategic buyers planning comprehensive strategies for the long term.

But even strategic buyers proceed cau-tiously, purchasing "a small set of Link-ware code, trying it out and growing from ere," Benoit says. Follow-on sales com-sed 35% of 1986 revenue, according to

While many MIS shops are reluctant to commit to link technology before IBM plays its full hand, Linkware emphasizes to potential customers that IBM, no matter what its direction, "will not do any-thing for DEC VAXs, Macintoshes or the tning for DEU VAXs, Macintoshes or the HP 3000 family." As IBM's LU6.2 and Server Requestor Programming Inter-face protocols unfold as standards, Link-

says it will supp STEVE FELDMAN

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ion reaching the Australian marks This bi-morehly publication covern elecommunications, office commu

tions and network manage has a circulation of 10,000

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Australia's magazine for the Macintosh user com unity, it is oub nthly and has a cir on of 12,000.



## The little IBM PCs that could: Joining hosts of two vendors

In an unusual micro-to-mainframe appli-cation involving hosts from two different vendors, four IBM Personal Computer ATs networked on an Hansamann Bace Inc. local-area network (LAN) serve as a data collections bub, clearing about \$5 bil-lion in government bonds traded daily. The cluster of PCs has been dubbed

'the little engine that could" for its modest but steady performance, chugging data along between an IBM MVS system and a Digital Equipment Corp. VAX/VMS

Installed at Prudential-Bache Securities, Inc. in New York, the system uously downloads batches of trades from government trading systems running on an IBM mainframe to the networked PCs. Clearance-eligible trades that must be settled that day are uploaded automatical-ly to a file server on the VAX. A file mangement system draws these files from the server for processing to a clearing k. Trade results are sent back down to the PCs for further reporting and are routed back to the IBM host for book-

eping. The system runs without human intervention through network and processor-independent file transfer software from Linkware Corp. in Waltham, Mass., and es scripts that are written by Pruden

These scripts, which are developed from Linkware's Script language, auto-mate logon and polling and also file transfer functions

## No room for error "This is a time-critical application," says

Peggy DeGraff, Prudential-Bache's man-ager of government systems. "We have to get about 400 to 600 cash trades over to the VAX every business day.
"There is no margin for error," she

The micro-to-mainframe link replaces a system involving manual rekeying at

es for error, according to Prudential "Before, anytime there was a trade, it was input into the government trading system," DeGraff explains. "Then someone else would key it into a clearance sys

n, then into a bookkee n, then into a bookkeeping system.
"Now, instead of keying in trades three or four times, they're keyed once into the trading system, and the PC net-work does the rest," she says. "We don't need various clerks all over the place. We w avoid the nightmare of piecing things ther when something is keyed in

nkware file servers, residing on both ets, act as staging areas for information

eded by the application.
Scripts periodically poll the MVS host
rver and download files into a server on

We put the PCs in the middle to talk to hosts," DeGraff says. Three of the PC ATs acc

rs and perform necessary format con-risions. "The fourth PC is the central control station, which acts like a traffic

cop, handling all the activities the other PCs are bringing it," explains Prudential-Bache's John Quattrocchi, a project maner. The control station maintains a master data base and system statistics

The entire system is totally self-suprtive." DeGraff says. "No operator has to hit a single key to move files along. Apart from the application, the control station can also perform transaction que

STEVE FELDMAN



## **Does Your Micro-Mainframe Application Look Like A Moving Target?**



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you hit the bull's-eye. 1. Experience. Hundreds of companies have lot the moro-mainframe bulls-eye with OBS solutions involving terminal emulation, life transfer, virtual disk data re-formatting, and

integrated application 2. Network support. OHS provi ucts support a wide variety of IBM network components. We can belo you with VM, MVS, wirefunction and asynchrosoms protorols, pro-torol converters, LU 6.2, local ners,

2. Success. Your wavesdul use of our products is what we value for ensure states, we must have umberstand your environment and

expectations. If we aren't then pontly convinced you'll be successful, we don't ship the product and you don't waste time

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Hirough its powerful script kingaage and API. Excelled delivers "one-hotton" applications for use by process XLC onservatour data re-formatting leature, supports all poundar PC spreadsheet and database applications.

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## **Bob Ashworth**

VP General Manager Information Technologies Division McKesson Corporation

Age: 44 Budget: \$65 million

Golfer

With micros, networking and telecommunications becoming more important every day, the influence of Informa tion Services is extending

well beyond its traditional boundaries. And with it, the influence of IS professionals. Bob Ashworth and thousands of other aggressive computer professionals like him are clearly on the fast track in America's larger corporations, controlling more than \$120 billion every year. Bob started with McKesson, the world's largest distributor of pharmaceutical

worst a singlest distributor on plan inacculoral products, as a project manager in applications development. His biggest single responsibility: the implementation of McKesson's proprietary Economost micro-based inventory/ordering system for druggiste which has after hear Economost micro-cased avenury/ordering system for druggists, which has often been credited with the company's fast rise to leader-ship in the highly competitive pharmaceutical distribution industry. With Economost running smoothly, Bob's attention is primarily devoted to serving the corporation at large. That means providing decision support for those who need providing decision support for mose win feet in, guiding the company in its acquisition of PCs (600 to date), and assessing the potential applications and value of a corporate LAN. In his spare time, Bod's an avid golfer, a snow skier, water sider and a jogger.

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## Micro-to-Mainframe Links

COMPANY	MODUCE	LAN COMPATIBLE	ACCESURE MAINTRAME DATA BASES	MICRO SECURITY	MADIFICAME	SUPPORTS VIRTUAL DISKS	SUPPORTS EXTENDED MEMORY	MENU DEIVIN	DOWNE OAD FORMATS	MICRO MEMORY EFQUIRED	BAUGATION HARDWARE SUPPORTED	MAINFRAME OPERATING SYSTEM SUPPORTED	SOFTWARE	MICEO POSTION PRICE (PER COPY)	MAINSTANG POSTION PRICE (PER MCU)	DIAL-MORTADER
Adelie Corp. 617) 354-9600	Close	NA	VSAM	Yes	Yes	NA	NA.	Yes	Proprietary	640K	Irms	cies	NA	NA .	NA	582
Agilio, Sec. 1800 538-1634	Feeton 3270	Yes	No	No .	Yee	Yes	Yes	Yee	NA	1986	ittel 2272. Irea compatible	AR DIM	Nune	Contact vender	Contact wonder	543
American International Communications Corp. 303) 444-4675	Network Nongstor	Yes	QSAM, PDS. CMS	Yes	Ves: ACF 2 RACF. Top Secret	No	No	Yes	ASCII, CSV, DEF	254K	IBN, CXI. Irna, Forte	MVS. VM	NA .	8175	\$80.000	584
Accepted Systems (SHE) 776-1616	Locus! Adverse	Yes	Des. VSAM. Adobse. IDSES	Yes .	Yes	No	Yes	Yes	1-3-3, Symptomy	254K	Irms, Forts, ISM 3278/ 0, AST, CE	MYS MYS MA DOS VIII. TRO. BASSIDC.	Assertion	8550	\$30,000- \$45,000	585
	Dissel -	Yes	IMS. VSAM, Adabas, IDMS	Tes	Yes	No	Yes	Yes	Diese II, III: Pranswork	256K	SM 3278/ 9, AST, C33	MAY MYS MA DOBY YER TSO DASSIDE. CICS	Answer/DS	\$550	\$30,000- \$45,000	
Applied Data Research, Inc. (201) 874-9000	ADR/PC Datacom	Yes	Datacon/ Dis	No	Proprietary	No.	No.	Yes	DOF, ASCII	512K	Irms. PCOX, protocol converient, gateways	MVS. DOS	Detarren/ EB: Detarporry	\$495	Contact vendor	586
	ADR/IC Email	Yes	NA	No	Proprietary	No	No.	Yes	ASCII	512K	Irrus. PCOX, protocul converters. gateways	MVS, DOS.	ADR Email	\$195	Contact weeds:	
Artificial Intelligence Corp. (617) 890-8400	PC Link	Yes	Interfact	No	Ten	Yes	Мо	Optonesi	WICS, ASCID	254%	ISM 3270/ PC. Irms. Micropius, Focto	WYS/TSO	None	\$500	\$20,500	547
AST Research, Inc. (714) 863-1333	AST-PCOR	NA.	All	Tes	Yes	Yes	NA	Yes .	ASCII, Binary	47K	Proportary	VMCMS, all MVS. all CICS	Application dependent	\$495	NA .	581
	AST-SNA	NA.	All	Tes	Yes	Yes	NA.	Yes	ASCII, Beary	SOK	Proprietary	VMCMS, at MVS, at CICS	Application dependent	\$895	NA.	
Aratar Technologies, Inc. (617) 435-4872	Macmon- frame	KA	IDMES, IDMESUR, Adabas, IMS	Yes	Propostary	No.	Yes	Yes	ASCIL Macastoch Document Format	512K		TSO, CICS. CMS			\$500	589
	PA100 Turbo	No	IDAES, IDAES/R. Adobas. DAS	Yes	Proprietary	No.	Yes	Yes	ASCII	254X	IRM 3278- 2, 3, 4; IRM 3279-2, 24, 28, 34, 38	TSO, CRCS. CNES	Avecus RFT	\$1.195	\$500	
Banyan Systems, Inc. 1/617) #98-1000	Vines	Yes	Goldengate, PC Focus	Yes	Yes	Yes	Yes	Tes.	DIF, ASCII	100K	Any ISM PC compacitie	CICS, TSO, MYS, CMS	Nane	\$1,295- \$3.995	\$1,295 \$3.995	590
Sorr Systems, Inc. 904) 371-3050	Burr/Hasp	Yes	QSAM	No	No	Yes	MA	Yes	ENCOR. ASCE, Beary	254K	Burr 2, Burr/20048	MYSGES. VM/RSCS. CDC/NOS	None	\$1,290	NA.	591
Bridge Communications, Inc. 415) 969-4400	Etherterm 3270	Yes	NA	NA	Yes	N <sub>3</sub>	No.	Optomal	ASCE	384K	Esherink	VM/CMS, TSO, QICS	None	\$400	NA	592
CAP Genial Sefeware Products, Inc. 214) 247-5454	Multipro	NA	Multipro Project Library System	Yes	Yes	No	Yes	Yes	ASCII	326K	IBM 3276/ 9, Irms. PCOX, protected	VIM-CMS. MVS/TSO	None	82,950	ESO 100	593

## Connection

networked with the first main-frame. There are several areas in which the developments will take place. The first area that will have to be addressed is effi-ciency. Cullinet's Armstrong says, "Underneath it all, the bot-tleneck is SNA. Without real

breakthroughs in communica-tions capabilities, we have a fair-

IBM's next generation of desk-top machines. IBM has stated that it is not interested in "com-modity marketplaces" for cheap boxes like low-level PCs, if that is where the market goes. In mar-keting, the name of the game is product differentiation, and IBM learned a hard lesson in the clone

learned a hard lesson in the clone wars. With a new generation poised to ship, where is IBM like-ly to do its differentiating? I believe a good place to look is in connectivity. We have already seen corporate America dig in its heels at the prospect of

spending \$150 per copy to up-grade 1-2-3 software; is it really likely users will scrap the hardware they assers was scrap the natu-ware they have now for new IBM boxes, given the relative price/ performance ratios usually asso-ciated with new PC-type prod-ucts from IBM?

More to the point, will a few specialized graphics capabilities, a smaller footprint and incre-mentally faster CPU speed be enough to spur business to buy It seems the answer is no. The two pieces that are likely to make a difference are a more

powerful operating system and built-in, optimal connectivity. IBM's powerful advantage with respect to the latter is that it only has to worry about con-

necting to itself; it can let everyone else scramble to catch up. I one else scramble to catch up. I believe this is just the bait IBM needs for its hook. By contrast, the operating system, while a key element, is partially in some-one else's hands — Microsoft's. New connectivity facilities

could be a fascinating opportunty for Tangram, whose devicever-based architecture would

permit the development of highend communications software to install with its users. "VM main frames today, when they first come up, already have several service machines running before

a single user logs on," saya Jay veloper at Tangram.
"That's a model you're likely

to see repeated in the future Kasler says, as multitasking becomes available. The potential to be ready to communicate with a specific and optimized task from power-up is very attractive. •

COMPANY	PRODUCT	LAN COMPATIBLE	ACCESSIBLE MAINFRAME DATA BASES	MICRO SECURITY	MANHEAMS	SUPPORTS VIRTUAL DISKS	SUPPORTS EXTRNOSED MEMORY	MENU DEIVEN	DOWNLOAD FORMATS	MEMORY	EMULATION HARDWARE SUPPORTED	MAINTRAME OPERATING SYSTEM SUPPORTED	SOFTWARE	MICRO PORTION PRICE (PER COPT)	MAINFRAME PORTION PRICE (PER MCU)	DIAL-ING READER
Carleton Corp (617) 454-1232	CQS- ledotek	Yes	IDMS, IDMS/R. Adahar, IMS	Yes	Yes .	No	Na	Yes	CSV, Sylv	320K	frma. PCDE, Forte, Lare Data, IBM 3278	MYS, VM/ SP	PL/1 Liferary, Cobol Compiler	\$100-\$500	\$47.500	364
Cincon Systems, Inc. 1000 543-3010	PC-Centuri	Yes	Supra. VSAM. INES, DL/1. Adulton	Tes	Yes: RACF. Top Secont	No	Ne	Yes	ASCIL DEF	198K	Iran, PCCE	MYS, VM. DOS	Mastin 4.0	\$500	\$30,000 \$38,000	505
Coefficient Systems Corp. 1212) 777 6707	VTERMI 220	No	All	No	No	Yes	No	No.	ASCII. Beary	256K	IBM CP with saye- chronous adopter	ASTS, VAX/VMS, RSX11. M/ MT, Deax	None	\$345	No charge	596
Communications Research Group (504) 923-0888	Blant	Yes	NA .	NA	MA	No.	Ten .	Yes ·	2007	254K	VTDOO. VTSS: Dam Grand Door	MAL YES	Manny .	\$350 r.	\$5,500	591
Communications Solutions, Inc. 1081 725-1568	Access/SNA 3270		NA .	No	Yes	Yes	Yes	Yes	ASCII. Beary	128K	Any IBM compatible SDLC card	MVS. VM. DOS/VSE	None	\$200	NA	598
	Access/SNA APPC	Yes	NA	No	Yes	Yes	Yes	Yes	ASCIL Brusy		Jay IBM compatible SDLC card	MVS, VM, DOS/VSE	Neet	\$200	NA	
Computer Associates International, Inc. (516) 227-3300	CALINA	No	CA- Universe, VSAM	Yes	Yes	No	MA	Yes	ASCII. Black, DIF, Back	254K	SOLC. Iron, POOR	VIAL DOSE VISE MVSE XA	N	\$100	\$9,500 \$11,500	599
Computer Corporation of America 6171 492 8860	PC/204	Tes		No	Yes .	Yes	No	Yes	ASCB, DIF.	384K	tres, PCOX		None	\$500	\$50,000 MA	600
	Picture/204 PC/ Workshop	Yes		No No	Yes	Yes	No No	Yes	ASCII, DIF. DBF	512K 646K	Iron, POX		Picture- power None	\$500	\$35,000	+
Computer Lagica 1116-674-1111	PEP	Yes	Mapper, DMS 1100	Yes	Yes .	360	No	No.	Linguige Procedure ASCE	256K	Proprietary	053,05/ 1100	None	Contact	Contact	661
	Combook	No		Yes	No	Yes	No	Yes	ASCII	254K	Proprietary	CMS. 05/3. 05/1100. MVS. CMS. MCP	None	Contact	Contact	1
Computerized Office Services, Inc. :3121 665-8778	Synchrono	No	None	No	Yes	No.	NA	Yes	ASCE	199K	RS-232	Uax	None	\$345	8545- 8995	602
Conshare, Sec. 1800, 922-7979	W/ Information Gateway	No	IDMS, DSIZ, Total, VSAM, SQL/DS, Seguretal files	Yes	No	No	No	Yes	ASCII. Beary, DEP, Diese	512K	-	VM/CMS. MYS/TSO, VMS, TAX/ VMS	U/Dataman	\$460	85,400 833,600	603
Consolink Corp. (800) 525-6705	Microlan 1000	Yes	082	Yes	No	Yes	Yes	Yes	ASCII	NA .	NA.	VAX/VMS	Street Talk	\$150	NA .	604
	Microba 2000	Yes	082	Yes	No	Yes	Yes	Yes	ASCII	NA .	NA BM 3078/	VALVMS			1	605
Corvus Systems, Inc. (400) 281-4100	SNA Guevas	Yes	DB2. VSAM, SQL	Yes	Yes: BACF. Top Secret		No	Optional	ASCII, Bloory				Proprietary	Contact render	Contact weather \$75,000	606
Cultinet Software, Inc. 16171 329-7700	CRCMS .	NA	IDMS/R. VSAM. IMS	Ne	Yes	No	No	Yes	Goldengate, ASCII, DIF, WKS, DRF	364K	Irea, INS, PCDX, Forte	A2 OS and DOS systems	Goldengste. Infogste	\$300 \$695		-
CXI. Inc. 1900 225-PCOX	PCDIE/One- APA	Yes	GDDM, Dusple, SAS/Graph, Telegraph	Yes	Yes	Yes	Yes	Yes	PV	354K	PCOX	Al .	None	\$595	MA	667
	CXISE	Yes	CICS. TSO. VM/CMS	Yes	Yes	Yes	Yes	No	ASCIL, EBCDIC	NA	PCOX	All	None	HA	\$395	
D&B Computing Services, Inc (203) 762-2511	Beaut	Yes	Normad2 SQL DBQ IMS IDMS	No	Yes	No	No	Yes	Symptony. PC Named	64X	frma, Forte IBM 3278 <sup>2</sup> 9. PCUL	VMICHS. MVS/TSO	Nomad2	NA	\$5,000	608
Datability Software Systems, Inc. 18007 342 5377	RAF	Yes	All YAX/ VHS	No	Yes	Yes	Yes	No	ASCII, Beary	256K	VT100, VT220	VAX/VMS. TOPS 20	None	\$385	\$395- \$25,000	609
Dataviz, Inc. (202) 366-4944	Mactela Plus	Yes	None	Yes	Yes Tep Secret. RACF	Ne	Yes	Yes	ASCII. DIF	256K	Macmonik. Teletope	vs	Orangate Allegro- server	\$350	\$455- \$4,000	610
Digical Communications Associates. Inc 1604) 842-8000	Irealnk FT/TSO	NA	NA	Yes	No	Yes	Yes	Yes	ASCH. Busy. EBCSIC	128K	lema lema	MYS/TSO	Nesse	875	NA NA	J*"
	frmatek FT/CMS	NA	NA	Yes	No .	Yes	Yes	Yen	ASCIE. Beary. EBCDIC		Hydra	VM.CKS	1	\$15		612
Deversified Data Resources, Inc (800) 233-3374	RCOM	161	VSAM specier queues	No	Tes	No	No	Optional	Briary, ASCI	***	-trens	UM, CKS under MVS DOS/VSE	-	20,00	\$4.000 \$8.000	1

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#### SPOTLIGHT: MICRO TO MAINFRAME

COMPANY	PRODUCT	LAN COMPATIBLE	ACCESSIBLE MAINTRAME DATA BASES	MICRO SECURITY	MAINTRAME	SUPPORTS VIRTUAL DISKS	SUPPORTS EXTENDED MEMORY	MENU DRIVEN	DOWNLOAD FORMATS	MEMORY	HARDWARE HARDWARE	MAINFRAME OPERATING SYSTEM SUPPORTED	SOTTWARE	MICRO PORTION PRICE (PER COPT)	MAINTRAME PORTION PRICE (PER MCU)	DIAL-ING READER
DTSS, Inc. (603) 643-6600	Deceptors	NA	None	Yes	Yes	No.	No.	Yes	ASCII, Binary	192K	Sone	GD06 1. II MOD400: Unix, VM; CMS, VXX; VMS	Nove	\$165	\$4.900	653
Dylabor 08180 366-1781	Dyl-Vank	No	IMS, DLIZ, IDMS/R. QSAM, ISAM, VSAM, REAM	Yes	Yes	Yes	Yes	Yes	M	254K	Irms. Forte PCOE, IDE	NVS. OS. VM. DOS VE	None	\$1,240	No charge	604
Execucion Systems Corp. (800) 521-5038	Link	NA.	IFFS	No	Yes	No	No	No	ASCII	512K	Asynch- roneus, Icrus, Forte, IBM 3270/ PC	MVS/TSO, VM-CMS. Proteos, VAX/VMS	IFFS19us	Smi	\$40 mis. \$65 mis	- 915
FEI. Competing (802) 348-7171	Mohan	Yes	All	Yes	Yes	Yes	Yes	Optomal	ASCII, Binary	ank	VT106	VAX/VMS. TOPS 18. TOPS 20	None	\$250	\$3,500	636
lot Deak Systems, Inc. 617) 533-2202	1st Port	NA	All	No	No.	Yes	NA	Yes	ASCII, DIBY Seda	128K	NA.	All	None	\$295	NA .	617
For Research, Inc. (803) 358-1010	10-SNA Turle LAN Manfrane Garrany	Yes	A4	Yes	Tes: RACF	Yes	Yes	No.	M	502K	IBM 3274	SNA MYS/ TSO, VN/ CMS, CICS			\$1.996	618
	10-BSC Turbo LAN Mandrane Gazensy	Yes	All	Yes	Tes: RACF	Yes	Yes	M <sub>0</sub>	All	SIZK	EEN 3274	CICS, MYS TSO, VNJ CMS	File transfer program	\$695	\$1,995	
Geteway Communications, Inc. 1900 367-6555	G/SNAmt	Yes	Any SNA/ SDLC supported application	Yes	Yes	Yes	Yes	Yes	ERCDIC. ASCII	256K	IBM 3270/ 3770 RJE	Any IBM 3270 REE coverse- coret	Ars IRM 3270, INDEPILE, RIE	\$2 530- \$4 530	NA.	619
Seleway Microsystems, Inc. 512) 345-7791	Specials	No	All	No .	No	No	No	No	Seary, ASCII	256K	Synctonia	CICS. TSO. MVS	PCOM, RJE, IBM 3270/SNA/ BSC	\$095	NA .	620
Grafpoint (400: 249-795)	Tgraf-05	NA.	X	No	Yes	NA.	NA.	Yes	NA	256X	Teldranics	Various	Application dependent	\$395	54	621
	Taet-05	Yes	SA	No.	Yes	NA	NA.	Yes	NA	254K	Tektronics	Yarres	Application dependent	\$395	NA .	1
Scwiett-Packard Co. 916) 786-8000	Information	Yes	Image 300	Yes	Yes	Yes	Yes	Yes	WKS, ASCE,	512K	NA .	MPE	None	\$395	\$500	622
Conywell Information Systems 800 328-5111	PC 7800	Yes	AN GEOS. DEMS	Yes	Yes	Yes	Yes	Optional	ASCII	NA NA	Any RS-232 port	GCOS	None	\$295	54	623
BM Sefermation Systems Group 114) 934-4000	IRM PC 3270 Ematetos Program 3.0	Yes	VSAM	Yes	Tes	Yes	Yes	Yes	ERCDIC. ASCII	156K	Proprietary	Leus	HM PC DOS	8475	NA	624
deassociates, Inc. 617) 663-6878	Meacumm 3278	No	TSO, VM	No	Ne	Yes	No	Yes	ASCII	128K	All .	All	None	\$965	N	N25
	Mesowan	No	TSO, VM.	No	No .	Yes.	No	Yes	ASCII	128K	All	м	Nine	Sees.	NA .	7
aformation Builders, Inc. 2123 736-4433	Foctalk	Yes	DRZ SQL/ DS, IMES/ DR. IDMS, Total, Database	ХА	Yes	NA .	XA.	Yes	ASCR, DIF. PRN, WP. 1- 2-3	2548	lens, Forte, PCOX, IBM 3270/PC. IBM 3276	YNUCHS. MYS/TSO, CICS	Focus Report Writer, PC Data Export	\$450	Contact render	626
Information Resources, Inc. 6171 896-1100	Easytrat	No	Infoscan, Nation Data, CME, Same Data	Yes	Yes	Yes	Yes	Yes	DBF	646K	Icro Forte	VMCMS Pressor	Name	\$1.495	74	627
	PCeapross	No	All	Yes	Yes	Yes	Yes	Yes	DIF ASCB	640K	lena, Forte	NA	None	\$1.495	54	4
ofermation Technologies, Inc. 100) 431-3460	Laskop	Yes	Al	No	Yes	Yes	Tes	Yes .	ASCII. EBCDIC, Bossy	254K		compatibles	Application dependent	NA	\$720	628
nnevative Computer Products 6001 228-LINK	Tempus Lara	Yes	VSAM	Yes	Yes: Top Secret, RACF	Yes	NA .	Tes	PRN	1286	Data.		None	54	Sware Sun rem	N/N
1	Tempus Access	Yes	IDMS. DUT: VSAN	Yes	Yes Top Secret. RACF	Yes	SA	Yes	PRN	1286	ATAT Merophes, 1951 22701 Pc. Irona Forte CU. ITT. Lee Data, Baro, m	MVS/TSI MVS/DIS MVS/DIS VM-CMS DOB/TSE	New		\$5 NO.	
Integrated Retwork Systems, Inc. 2009 SNA-3270	SDLC PC Adapter	Yes	IDMS	No	Yes 0	Yes	No	Yes	AE	128K	INS	AL .	Nese	\$995	NA .	636

COMPANY	PRODUCT	LAN COMPATIBLE	ACCESSIBAT MAINTRAME DATA BASES	MICRO SECURITY	MADINEAME	SUPPORTS VIRTUAL DISKS	SUPPORTS EXTENDED MEMORY	MENU DRIVEN	DOWNALOAD FORMATS	MEMORY	EMULATION HARDWARE SUPPORTED	MAINFRAME OPERATING SYSTEM SUPPORTED	SOTTWARE	MICRO PORTION PRICE (PER COPT)	MAINFRAME PORTION PRICE (PER MOJ)	DIAL-ING READER
KMW Systems Corp. (512) 338-3000	SELC Gateway PC	Tes	IDMS	Yes	Yes	Yes	No	Yes	All .	254K	INS	Ai -	None	\$1,985	NA.	T
	AVSCOM 8400 VME channel sterface	Yes	NA.	No.	NA .	NA	NA	NA	NA	2K-10K	NA.	AL .	Application dependent	Contact sendor	Contact sendor	
	AVSCOM 8900 Q-bus classed asterface	NA	MA	NA .	NA.	XA.	Yes	NA .	NA .	SE-SEK	IBM	м .	Application depundent	Contact wender	Contact rendor	٦.
Linkware Corp. (800) 356-1212	Linkware Reformation Server	Tes	None	NA	Yes, Top Secret. RACF, ACF 2	No	NA	Yes	WKS, DIF, PRN, CSV. Sylk	NA	NA	MVS/TSO, Unix, MVS/ VTAM VMCMS, VAX/VMS	NA.	NA.	\$2,000 \$35,000	632
	PC Cennecties	Yes	NA.	No	NA	No	NA	Yes	WKS, DEF. PRN, CSV, Sylk	254K	IRM 3270, PCCIE, Forte, from	MVS/TSO, Unix, MVS/ VTAM, VM/CHS, VAX/VMS	None	\$500	NA	1
Lorus Computing Corp. (213) 450-3435	PC Interface	Yes	Any Unix data base	Yes	Yes	Yes	Yes	No		**	PC .	Uhin V.S. Uhrir 1.1, 1.2, 4.2, Tenin	Nane	fate	9600	633
Management Science America, Inc. (464) 229-2000	Expertink	No	EMS. IDMS. Data: ser/DB	Yes	Yes .	No.	No.	Yes	ASCB, DEP, WXS, WEX, Disease II, ER	254X	CEI, Irma, IBM 3278, 3276/PC, Microphia, PC Pothways	MVS, VSE	Information Expert for file transfer only	\$3,000	NA .	634
McCormack & Dodge Corp. (817) 655-6260	Interactive PC Link	Yes	DAS, IDAS, VSAM, Adabas	Yes	Yes	Yes	NA.	Optional	ASCE	256X	CELL HAM SETTIFA HIM SETTIF FC	DOS	Nune	\$1,100	\$32,560	635
Metaresearch, Inc. 1503) 228-5806	Graffin Terminal	No	Chemical Abstracts On-Line	No	No.	Tes	Yes	Opnoral	ASCII, Boury	128K	TEX4012, VT100	VMS, Unix	None	\$99	NA	3 636
Micro Decisionware, Inc. (202) 443-2706	PC/SQL Last	Yes	VSAM. SQL, DRz. Tenista. Britton Lee	Yes	Yer Any TSO security package	Yes	Yes	Yes	DEF. DOF. DEF, PROF	300K	Irms, Porte IBM 3575/ PC, 3578/9 SDLC, CIT	MVS, VM	None .	\$295- \$595	\$19,800	637
Micro-Integration, Inc. (800) 227 5888	Macro-SNA/ 3270	Yes	None	Yes	No.	Yes	No	Yes	ASCII, Beary	256K	25-232	*	None	\$695	NA NA	638
	Coessays	Yes	None	Yes	No	Yes	No	Yes	ASCIL Briary	64K	Proprietary Jenu	W	None	\$495	NA .	1
Hicro Tempus, Inc. (100) 361-1983	Tempus- Access	Yes	Total. Adoles. VSAM. IMS, DL/I., IDMS	Yes	Tes	Yes	No	Yes	PRN	SAK	Irma, IIIM, Forte, PCOX, AST. Micropian	MYSICICS. MYSITSO, DD6/VSE/ CICS	Tempes Link	No charge	\$13,900	639
	Tempus- Losk	Yes	Total. Adabas. VSAM, IMS, DE,/I., IDMS	Yes	Tes	Yes	No	Yes	NA.	128K	Irma, BIM, Forte, PCOX, AST. Micropius	MYSCICS, MYSTSO, MYSTIGS, DOSVSU, CICS, VM, CMS	Nene	No charge	\$9,800- \$60,000	
Midwest Data Source, Inc. (513) 752-3311	Intercom	Tes	DMSB	Yes	Yes	Yes	Ne	Yes	ASCIL Boary, WKS. DBF	254K	Intercom 1000	МСР	XTRACT. ICC/Link	\$295- \$745	Contact ventor	640
The MOM Corp. (800) 241-1170	PC/COM- FT	Ма	Nme	No	Yes	No '	Yes	Opcored	DEF, WKS, ASCIL Bleary	64K	Irms, Porte CXI, AST, Questran, Micropha, Resear, ITT	DOS, MYS, VM	Nesse	\$396	\$1,000- \$2,000	641
	PC/COM-	No	None	Yes	Yes	No	Yes	Yes	DIF. ASCIL.	256K	TIM, Irms, CXI, Forte	DOS, MYS,	None	\$195- \$665	\$2,985- \$25,000	1
Multi-Soft, Inc. (201) 549 7722	Super-Link	Yes	None	Tes	No.	Yes	N <sub>6</sub>	Yes	ASCIL Beary, DEF, PRN	384K	IBM 3270. brna. PCOI	MVS, VM, DOS/VSE, VAX/VMS	IBM PL/1. Library	\$50- \$200	\$48.000	642
Name Corp. 313) 353-3300	Design Auty Host Link	Yes	NA	Tes	No	Yes	Yes	Optional	ASCII	646K	MM PC an	DOS, VIAS	Tempus- Link	\$4.900	MA	643
Serwork Software Associates, Inc. (714) 768-4313	Adapt SSA		YSAM	No	Yes	No	No	No	ASCIL Bran	254K	IBM SDLC	MVS, DOS VS, DOS/ VSE	None	\$585	NA.	644
On-Line Business Systems, Inc. (415) 200-9535	Excellen	Yes	NA	Yes	Yes RACF 2. RACF, Top Secret	Ma	Мо	Yes	Sylk, WISS, CSV, DIF	128K	Irms. Forte CNI, Aspect- reseas	VM, MVS	None	\$75- \$200	\$7,500	645
	VDAM	Yes	NA .	Yes	Yes RACF 2. RACF. Top Secret	Yes	Mo	Yes	Sylle, WES, CSV, DIF	128K	Irms, Forts CRI	MYS .	None	\$45- \$400	\$8.500	1
On-Line Software International, Inc 1800: 526-0272	Oraniak	No	ISAM. BOAM, VSAM DL, L EDMS	Yes	Yes	Ťes	Yes	Yes	WKS, DIF ASCII	256K	IBM 3270	DOS/VSE. MYS/OS. CICS	None	\$495	\$20,000 \$30,000	646

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COMPANY	PRODUCT	LAN COMPATHLE	ACCESSIBLE MAINTRAME DATA BASES	ANCRO SECURITY	MANNEAME	SUPPORTS VIRTUAL DISKS	SUPPORTS EXTENDED MEMORY	MINU DRIVEN	DOWNLOAD	MICRO	BMULATION HARDWARE SUPPORTED	MAINFRAME OPERATING SYSTEM SUPPORTED	SOTTWARE	MICRO PORTION PRICE (PER COPT)	MAINTRAME PORTION PRICE (PER MCU)	DIAL-ING READER
On-Line Softween International, Inc. 800) 528-0272	Free-Lask	No	ISAM. BEAM. VSAM	Yes	Yes	Yes	Yes	Yes	WKS, DEF. ASCII	254X	IBM 3270. Asynch- ronous	DOSAYSE. MYSIOS. CICS	None	\$495	\$10,000	1
	Ramink	No	DAS, DE/II, DB2, SQL/ DS, IDMS, Total	Yes	Yes	No	Yes	Yes	ASCE, DEF. Keept, Sequential	512K	Irms, Forte, IBM 3276/ 9. 3276/PC, PCOX	VM/CMS. MVS/TSO, CRS, MVS OB, TCAM	Rams	8375	\$49 000. \$115,000	1
Oracle Corp. (800) 345-DBMS	SQLeter	Yes	Oracle, DBS	Yes	Yes	NA	Yes	Optional	WES	540K	Irms, IBM 3270, Decast	MYS. VM. Usin, VMS. ACP. France. UTF. GCOS, VF	Application dependent	\$495- \$1.606	Centart	647
The Orion Group, Inc. (415) 548-6947	SNA 62 Peer Communica Lone Facility	No .	NA .	Yes	Yes	Yes	NA.	Optional	NA .	254X	NA	Any DIOL	None	NA.	NA	648
	DIA Source Recipient Facility	No	NA	Yes	Tes	NA.	NA	Yes	NA	256X	NA .	Unix	Nesc	NA .	NA .	
Package Solutions, Inc. (\$16) 752-2642	Bloom M-3700	No	MA -	No	No	No	No	Yes	ASCE	64X	2780	MOT. NVT	None	\$895	NA	649
Panaophic Software Corp. (800) 323-7335	Panink	Tes	None	Yes	Yes	Yes	Yes	Yes	ASCII	16K	Bunyan Server. IBM 3278/ 9. PCOX. Irma, INS. AST-SNA, AST-BSC	CICS, CMS, TSO, IMS	None	NA NA	\$9,900	650
	The Corporate To	Yes	м	Yes	Yes	Yes	Yes	Optional	ASCII	16K	Irms, Forte, Micropius	cics	NA .	KA	\$18,000- \$42,000	
Puthway Design, Inc. 1617) 237-7722	PC Park	MA	AL	Yes	Yes	Yes	Yes	Optional	An	254K	SNA 3270. Proprietary	4	None	\$890	NA .	651
	Netpath	Yes	4	Yes	No	Tes	Yes	Yes	Any	254K	Proprietary	M	None	\$2,495- \$4,496	NA.	1
Performance Software, Inc. (804) 794-1012	Masterink	Yes	VSAM, Spooler files	Yes .	Yes: Top Secret, RACF	No.	No	Yes	CSV. DBF. ASCE, Beery	40K	Irms, CXI, AST. Hydra, ITT, Forte, Reses	DOSAVSE. MVS	cics	NA .	\$4.500- \$9.500	652
Persoft Inc. (600) 273-6860	Severteren 240	Yes	XA	No	No	NA	ж	Yes	ASCE, Beary	512K	NA .	Any DEC operating system	Mone	\$296	NA.	653
	Smarterm 400	Tes	ж	No	No.	NA.	MA	Yes	ASCE, Beary	192K	NA	Any Data General operating system	None	\$149	NA.	
Phaser Systems, Inc. (415) 434-3990	VDAM	Yes	EDMS, DAS, CICS	Yes	Tes: ACF 2, RACF, Top Secret	Yes	Tes	Yes	ERCDEC. ASCII, field translation	64X	1804 3278/ 9, 3770, 3278. ssynch- ronous	MVS	ACF. VTAM	Free	\$50,000	854
Polygon, Inc. (314) 576-7700	Pely-Star	Yes	Datassieve	No.	No	No	No	Yes	ASCII. Benry	400K	VT100, VT52, VT220, VT341	wayne.	Poly-XVIII/ Mess	\$300	\$545	655
Protocol Computers Inc. (618) 880-6900	Seartlek	Yes	VTAM	Yes	Yes	No	Yes	Yes	ASCII, Bessey, EBCDEC	128K	NA	YMS	None	\$195	NA.	656
Quadram Corp. (404) 923-6666	Meindak Plus Cons Commettum	Yes	All .	Yes	NA .	No	No.	Yes	ASCII, Benry	364X	9, 3287	All SDLC- supported operating systems	Application dependent	\$3,145	NA	657
	Maninh Scantori Coss Consection	Yes	A	Yes	NA.	Mo	No	Но	NA .	968	1884 3287/ 9, 3287	All SDLC- supported operating systems	Application dependent	\$895	NA.	
	Quad3270 Gaseway	Yes	М	Yes	NA.	No	Мо	Yes	ASCII, Binary	128K	IBM 3278/9	All SDLC- supported operating	Application dependent	\$3,290- \$6,742	NA	
Relational Technology, Inc. 8001 4INGSES	Ingresi PCLask	Yes	Ingres	No	Yes	Yes	No	Yes	ASCII. Boury, WKS, DEF, DEF, S-IB, WK1, WEX, WE1, DEF II, DEF III. Ingres	256K	VT100, VT220	VAX/VMS. Unix VM	No .	\$200	\$22 000	658
Renet Corp. (703) 491-3300	ELMA/EAF	Yes	Al	Yes	NA	Yes	MA	Tes	Donry, ASCII	384K	Resers, CIU.	AB	Application dependent	\$150	NA.	659
The Santa Cruz Operation, Inc. (800) 626-UNIX	SCO Unsperit SNA-3276	Yes	NA	Yes	No	No	No	Yes	ASCII. Benny	254K	UDS, Sync- UP, SCO, synch- rmous, Pennyst	All 1804 companie	Xeax	\$595 \$1.995	NA.	560

COMPANY	MODUCE	LAN COMPATIBLE	ACCESSIBLE MAINTRAME DATA BASES	MICRO SECURITY	MAINTRAME	SUPPORTS VIRTUAL DISKS	STRNDED SXTRNDED MEMORY	MENU DEIVEN	DOWNLOAD FORMATS	MEMORY	IMULATION HARDWARE SUPPORTED	MAINTRAMS OFTRATING SYSTEM SUPPORTED	SOFTWARE	MICRO PORTION PERCE (PER COPY)	MAINFRAME PORTION PRICE (PER MCU)	DIAL-ING READER
\$A\$ Institute, Inc. (909) 467-8000	Base SAS Software	Yes	SAS	No	No	No	No	Optsonal	DIF, ASCII	512K	frms, CXI. Forte, IBM 3278/9	CMS.	None	NA	\$5,000 \$12,000	661
SCA Products and Services, Inc. (212) 532-2990	Gateway PC	Tes	Ramin. Focus	Yes	Yes	Жо	No	**	ASCII, Sheary	512K ·	Irms, Ports, CIX, 1994 SETER, VT100, VT11, Telesype X.PC, X. Medam	TSO TSO	Ď.	\$350	\$18,000	642
Sineware, Inc. 04130727,1779	SIM 3278	NA.	ALIBM DOMS	Yes	Tes	Yes	NA	Yes	1884 3270. ASCII	NA.	Νί	VM. MVS/ VTAM	None	NA.	\$3.500-	663
	SIM 3278/ PC	Yes	AZERM DEMS	Yes	Yes	Yes	Yes	Yes	IIM 3270. ASCII	254K	Irma, Forte, IBM 3270	VM, MVS/ VTAM	None	\$250	NA .	
Singer Corp. (201) 640-7999	TM/120	Yes	None	No	No	Yes .	Me	Yes	ASCEL WKS.	256K	NA C	XA .	New	1796	MA	664
Seftrenics, Inc. (303) 593-9540	Settern PC	Yes	All	No	Tes. Top Secret. RACF	Yes	No	Yes	Any	192K	ISM styric. boards	VAX/VMS. Unax, AOS. CICS	Application dependent	\$195	NA NA	665
Software AG of North America, Inc. (800) 336-3761	Natural Connection	NA	Adobes. VSAM. DL/I	Yes	Yes	No	Ma	Optional	Disser St. Disser St. DIF. ASCII	190K	Treat, FTT, 1994 NETWY 79, PCOS. 1970. del	OR MITS MYS/XA, DOS	Hope	\$250- \$1,000	\$15,000 \$25,000	644
SPSS, Inc. (312) 329-3560	SPSS/PC+	NA	Datatreve. SQL/DS.	NA.	NA.	No	No	Yes	ASCII	348K	Heath 19	AI	SPSS-X	1795	\$3,000	667
Storling Software Systems Software Marketing Division (\$16) 635-5535	PC-Tracs	Yes	None	Yes	Yes Top Secret, RACF, ACF 2	No	M	Yes	ASCIL. HBCDIC	MK	HIRA 3780. 3770, 2780 3274/3270	All	Mane	1990		865
	Supertrace	NA	Name	Yes	Tes Top Secret. RACF, ACF	Мо	ж	ж	Any	MA	1204 2730. 3730	DOS, OBV	New Year	NA .	\$18,000 \$36,000	
The Systems Center (800) 292-0504	NDM-PC	Yes	None	Tes	Tes .	No	Tes	No	ASCII. Beary	300K	CUL Pathway, PC Park, SNA 3270	MVS, VSE	Application dependent	\$400	\$22,000	669
Systems Strategies, Inc. (2)23:279-8400	VAX Ludy SNA	Yes	All YAX	ж	NA .	NA	NA	Yes	ASCIT, ENCORC	NA	KMV, ECT	MYS. OS.	CCumplin	83.500 17.000	NA	670
ulipar Penn	VAX-Link/	Yes	AD VAX	NA	MA	MA	M	Yes	ASCIL. ERCDIC	NA	KMV, KCT	MVS. OB, DOS/VIN	CCumpler	82.500- 87,000	NA	1
Sytek, Inc. (415) 966-7400	System System 2000/ System 6000	Yes	NA NA	No	Yes	Tes	No	Yes	ASCR	80K	VT100, VT52, KS2	Ultria. VAX, VMS	NA .	\$76	\$5 300	671
Tangrasa Systema Corp. 19131 481 4444	Arbiter	Yes	SAS-deta sets, flat files	Yes	Yes: ACF 2, RACF, Top Sector	Yes	SA	Optional	Asy	30%	CCU, Irma, INS, IRM 3278, 2706 NCP. December APPC	MVS. MVS.	ACSYTTAL	NA	\$12,500- \$38,000	672
Yechland Systems, Inc. (800) Techland	Muelyta 3276R	Yes	Infognte, Goldengate, Arbiter, Micro Tempus	No	Tes. RACF. Top Secret	Yes	Yes	Optional	EBCDIC. ASCII	192K	1804 3278/5		None	\$795	NA.	673
	Sharlyon 3270 Ad- vanced Con	Yes	Infugate, Goldengate, Arbites, Micro Tempus	Tes	Yes, RACF, Top Secret	Yes	To	Opennal	ESCINC. ASCII. Benary Batch	226K	1804 3278/5	Al	IIM HFT	\$965	Contact vendor	
Tensoract Corp. (415) 543-9320	Intelligent Data Link	16s	VSAM, IDMS, DAS	Tes	Tes	MA	NA	Optional	DIF. ASCII	254X	1004 3270 SMA, Ires	MV3/EOS	CICS, DIES	\$400	No charge	674
Try-Data (415) 969-3700	Netway 1990A	Yes	Yes	Tes	No	Yes	NA	Yes	ENCOIC. Avusar RFT	512K	Netway 1000A	CMS, TSO, VM, CKS, VS	None	No-charge	\$3.195	675
Triagrationia Corp. (603) 863-0568	TC-Last	Yes	Al .	Но	Yes	Yes	Yes	Yes	ASCII	128K	IBM 3976, 5250	YM MYS	Hone	\$799- \$4,160	KA	676
TSI International (203) 846-2101	Ken/Master XTA	Yes	VSAM	Yes	Yes .	Yes	Yes	Optional	Proprietary	512K	Irea, RJE	Al .	None	\$300- \$1,000	\$11.566- \$35,000	677
VM Personal Computing, Inc. (203) 758-4755	Relay Gold	Yes	A3	Yes	Yes	Ne	No	Optional	Amy	190%	Irms, Forte. IRM 3270	NACHS MANALED	Hone	1390	MA	678
	Relay/VM. Relay/T90	Yes	M	Yes	Yes	No	No	Yes	Any	192K	Irms, Forse, 1884 3278	VYACMS. MYS/TSO	Mone	NA	\$6,500- \$9,500	1 .
Waterbalter & Associanes (313) 662-2002	Data Talker 3270	No.	All	Yes	NA .	NA	NA.	Yes	Any	128K	IBM 3279. 3278/9	All	None	\$1,295- \$2,396	NA NA	679
	Data Talker Cluster	No.	A3	Yes	NA	NA	NA	Yes	Any	128K	IBM 3270, 3278/9	AI .	None	\$1,295- \$2,395	NA .	
	Data Sync	Ne	All	Yes	NA -	NA	NA.	Yes	Any	128K	1894 3270. 3278/9	A3	None	\$1,295-	NA	1

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DIAL-INQ reader service numbers in the boxes provided in step 6.

3 Call the Computerworld DIAL-INQ inquiry service via touch-tone telephone and wait for the recorded instructions.

Dial 1-413-637-3170 anytime, 7 days a week, 24 hours a day.

When prompted by the instructional recording, enter
your DIAL-INQ subscriber number and symbols as recorded below.

You will be prompted to enter the DIAL-INQ number, including the symbols, for the first product/service you've identified below. You will be prompted to repeat this step as needed to input additional DIAL-INQ numbers.

To key in more than 17 inquiries, simply make another telephone call once you've signed off from

another telephone call	once you've signed off fro
the first.	
1.	10.
2. 🗆 🗆 🗇 🗹	11.
3.	12. 🗆 🗆 🗗 🗗
4.	13.
5.	14.
6.	15. 🗆 🗆 🗷 🗷
7.	16. 🗆 🗆 🗷 🗷
8. 🗆 🗆 🗷 🗷	17. 🗆 🗆 🗆 🗷 💌
9. 🗆 🗆 🗷 🗷	

7. Complete your phone call by entering the following symbols:

You've now successfully completed your inquiry call to Computerworld DIAL-INO. Remember ... you can make as many phone calls as you wish — and request information about products/services in any SPOT-LIGHT section up to three months from the issue date.

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10:18: 'Hey, it just answered back.







10:29: "I talked to the mainframe. Wait'll I tell my kid."

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Software Solutions, Inc. is now DataEase international Inc. What it does is hard. How it does it is easy.

## IN DEPTH

# How *not* to build an expert system shell

One firm's folly offers a lesson in choosing a development tool

#### BY HENRY ERIC FIRDMAN

oneider the following situation: Victory Group, a venture capital firm, is funding Genesis Corp., an expert systems startup. (Both are real firms with fictional names.) Genesia's technical staff consists of experience programmers, all accomosibed in conventional voftware

development.

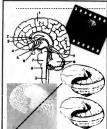
As a demonstration model,
Genesis presents a 20-vale expersystem More precisely, the
system is a simple decision tree
to which, Genesis emphasizes,
additional functionality will be
added at the project's next stage.
According to the business plan,
Genesis will develop a full-scale
rule-based prototype of the system in the next six to nine
months.

The final product must be an interactive system. While Genesis's demo shows an excellent response time, the end-user interface is not very effective. Genesis tells Victory that the will be fixed at later stages of the

In addition, the business plan calls for product sales to be highvolume and therefore relatively inexpensive. For this reason, a personal computer-like environment is virtually mandatory, and development under expensive expert system shells was not considered.

Nine months later, Genesis comes up with a 500-rule prototype. This prototype is not just a

Firdman is president of Henry Firdman & Associates, a Lexangron. Maissbased consulting firm specializing in artificial intelligence and expert systems. He is publisher of "All Through the Looking Glass," in rewaletter on the Al industry. Another version of this article first appeared in All Expert magazine.



occision ree; in some situations, a number of alternative rules can be applied so that a truly smart system could make a choice among the rules. Superficially, the prototype seems to be a genuine expert system.

But, what a system: It sometimes takes four to five minutes to respond to a relatively simple end-user query. As a result, Victory reasonably figures that the consequences of developing an efficient end-user-oriented interface on top of this prototype may be devastating to system

The venture firm realizes that the product Genesis outlined in its business plan may never come to fruition unless radical measures — perhaps a total redesign

As a result, a lot of finger pointing goes on between Genesis and Victory. Some of Victory's partners even maintain that Genesis deliberately misrepresented lits product. Some people from Genesis accuse Victory of ignorance, claiming that performance degradation is intrinsic to artificial intelligence

Learning by mistake The selection of a cost-effective

expert system development tool or shell should be a custious process. There are a sumber of subtle issues that need to be addressed and shell parameters to be considered to provide a reasonable fit between the application and the shell.

What really happened to Genesis's expert system? First of all, having previously dealt with structured, nested IF-THEN-ELSE statements such as decision tables or trees. Genesis's technical staff believed that the time required to find a relevant rule changes logarithmically with the total number of rules. That belief was a mistaken. That belief was a mistaken.

with the total number of rules. That belief was a mistaken one, resulting from lack of Al experience. In fact, because of the nature of forward- and backward-chaining control mechanisms and, of course, the pattern matching on which both are based, the time required to find a relevant rule changes in the following the course of the pattern of the pat

relevant rule changes in the following ways.

• Linearly with the total number of rules, if only one rule can be applied in each situation. In this case, the total set of rules can be thought of at the conceptual level, as a linear array of rules, with the forward-or backward-chaning control mechanism including array lookup as its inner loop. • Exponentially, if a number of afternative rules can be applied.

a Exponentially, if a number of alternative rules can be applied in some situations. In this case, the total set of rules can be regarded as a tree that must be exhaustively searched by the forward- or backward-chaining control mechanism to find a relevant rule.

With this understanding, it is

with this understanding, it is not surprising that the Genesis prototype performed poorly, typical example of combinatorial explosion. Each time the prottype face the problem of choosing among alternative rules, it solves the problem blindly by brute force, randomly picking out one rule and then trying another if the first does not succeed, resulting in performance ceed, resulting in performance.

ceed, resulting in performance degradation.

We can draw some important conclusions from this part of the

story: Lesson 1. There are two

- · Expertise, performance equally vital
- Adding one rule will double your runtime
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50 E. Swedesford Road Frazer, PA 19355 equally important facets of expert system rmance - the scote of its exhertise and its running time. Neither of them can be ignored in expert system develop

Although it had an impressive running mc. Genesis's 20-rule demo did not in sufficient scope of expertise Conversely, the prototype, while it had some scope of expertise, had an excessive noing time

Lesson 2. Special measures aimed at achieving an increasing scope of exper-tise in accordance with efficiency re-quirements should be taken; otherwise scope of expertise and running time will be conversely related. Taking these measures - not just adding new rules -makes no the most difficult part of expert

ntem deuesopment. Genesis did not take these measures - an obvious indication of its ignorance.

## ontrol strategies /hat could have been done? This question

brings us to the well-known notion of a control strategy — a set of chunks of problem-specific heuristic knowledge at guides a problem-solving process and

kes it more efficient. A control mechanism - forward or backward chaining — and a control strat-egy cooperate in that the control mecha-

n provides the search while the control strategy makes the search reasonable in terms of running time. Control strategies are represented in different ways. One popular approach is to attach so-called confidence measures to

alternative rules. This strategy looks for e most relevant rule in a given situ If successful, it eliminates rule application ambiguity and reduces the aforemenned exponential time dependency to a

Another widely used approach is to break down the total set of rules to a-relatively large number of small separate rule subsets. The idea is that an expert system will select a relevant rule subset and then look for the most relevant rule within this et. Selection of the relevant rule sub set is usually guided by special control rules that are sometimes called metarules. If it is successful, this strategy reduces the linear time dependency to the logarithmic one

No matter what control strategies are used in expert system development, the chances to have them built in an expert system shell are very slim. The reason is system sheu are very sum. I ne vessou es-clear: The expert system shell is, by der-nition, application independent, whereas a control strategy is essentially applica-tion specific. Another very important lesson can be found here:

Lesson 3. An expert system shell ould provide end user-oriented facilities for easy incorporation of control strategies. A shell having no such facili-ties makes developing an efficient com-

## at about shell price?

Going back to the case story, it turned out that the expert system shell that Genesis used did not allow the developer to incorporate any control strategies. The compawance was not the only reason for this

Another reason was the cost of expert stem shells. Remember, Genesis was to velop a high-volume, relatively inexe expert system. Obviously, the ex rt system shell had to be even less ex

PECIAL measures aimed at achieving an increasing scope of expertise in accordance with efficiency requirements should be taken; otherwise, scope of expertise and running time will be conversely related.

ive. With the final product targeted for the \$200 to \$300 range, Genesis had to find a shell for about \$40 to \$50 per copy. Therefore, the price of many, if not most, commercially available shells was prohibitive. It would seem that Genesis

· It could purchase a relatively inexpensive expert system shell with develop ment and runtime environments availseparately and negotiate the requir

price for the runtime environment at the time of purchase.

It could develop a proprietary expert

system shell in-house Unfortunately, Ge option. It purchased a \$39.95 expert sysem shell developed by an obscure hacker perating from a boat in Sausalito. The shell had no docum and, of course, no facilities for incore ing control strategies. Therefore, when

the system's developers encountered the efficiency problem with the 500-rule prototype, they had nowhere to go. Certainly, this choice was the worst ssible, and the company learned no les-

Lesson 4. Never use expert system shells that are not supported commer-cially. Deal only with vendors that are committed to providing high-quality ser-

Why not build your own? One interesting question remains to be addressed. How much could Genesis have done if it had followed one of the first two

Let us first consider the second option developing a proprietary expert



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system shell. Generally, I am opposed to eveloping proprietary tools, especially simultaneously with applications. This is as bad as developing a larger Pascal pro-gram in parallel with developing the first

There is at least one excellent acco of a commercial expert system that shows why developing a proprietary tool is not a

The system in question is the Dip-meter Advisor, a famous Schlumberger Ltd. expert system that processes meanents from a dipmeter tool to inter-signatures, or layers, of geological events. The history of its development has been described in Reid Smith's paper. On the Development of Commercial Ex-

In some respects, this history illustrates how not to develop commercial products. The Dipmeter Advisor project was run as a research venture; hence, it was driven by designers' interests rather than by the objective to build a cost-effec-

Not incidentally, the whole project cost Schlumberger about \$21 million, and it required three generations of designers

Of course, a number of reasonable ex-cuses can be found. The Dipmeter Advi sor was only later converted to a commer-cial project. It was begun in 1980, at a cail project. It was begon in 1990, at a time when neither expert shells not good runtime hardware existed. Not surpris-ingly, the Dipmeter Advisor developers: jumped from Digital Equipment Corp. Decaystem-20 to VAX-11/780 to Xerox Corp. 1108 machines and from Interlisp nalisp to Interlisp-D as implementa

tion languages.

One thing 1 find hard to excuse is Smith's hypothesis of "oscillating focus of attention in commercial expert system development." According to this hypothesis, the application development stage should alternate with the stage of expert m tool development

This may be a good idea for research into the next generation of expert system shells and knowledge-representation en-

vironments: however, it is absolutely wrong for commercial expert system de ot only are many come

ing expert systems, but few of them posis the experience to develop expert system shells. In the process of developing plications, these companies allow their velopment efforts and monies to get idetracked by tool development - to the

triment of the application. Oscillating application and tool devel-ment disrupts the whole project. It can make project management very difficult, significantly reducing chances of meeting segmanary resulting chances or meeting established deadlines and developing a product in a cost-effective fashion. In fact, providing enough redundancy to develop a variety of diverse and evolving applica-

tions, instead of oscillating between appli-cation and shell development, is a single major justification for today's generalpurpose expert system development en-

Lesson 5. Never develop your own ex-

ert system shells if you can find a com mercial one that is adequate for your ap blication. It may be muck easier to tailor on existing tool to your needs than to de selop a new one from scratch.

The time for proprietary tools Some notable exceptions to this lesson do

One exception is when there is no com-

Now we can expand on Lesson 4 as fol

Loops, a hybrid knowledge-representa-tion environment, was available only as a Another exception would occur if a commercial expert system developmen environment is available, but a cost-effec-Again, Apex is a good example of this Loops is excluded because it lacks not

equate for an application. One example of this is the development of a proprietary

expert system shell by Applied Expert

stems. Inc. (Apex) in Cambridge, Ma

ncial planner software project began,

no commercial frame-based development tools were available on Xerox 1100 LISP machines, so Applied Expert Systems had

to develop its own. At the time, Xerox's

In 1983, wheo Apex's Planp

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rcial support but also a run-

time version. A third exception is a case in which a proprietary expert system shell results from many years of previous research and velopment so that it actually appears as enhancement and commercialization of an existing tool. An example is Syntel, a p

prietary expert system shell developed by stelligence Inc. Many Syntel features were derived from SRI International's research on

tool for mineral exploration. Most Syntel ligence founders and Syntel developers came from SRI Lastly, an exception could be n

hen an application is targeted for highvolume sales and should be so inexpensiv

OST-EFFECTIVE runtime environments are a problem for commercial expert system development. The problem becomes critical if you are to choose a high-level development tool: The price may be high, and it is paying for things that are hardly needed at execution time.

that there is no way to find an affordable

expert system shell on the market. Although this can formally stand as a reason for developing a proprietary ex-pert system shell, this situation is not one that occurs often. In any event, I would

recommend trying a programming lan-guage, such as LISP or Prolog, before making any commitment to developing a

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r's address. When the same information goes on several pages, you

n off a paper form

Employing a staff of Al professionals who are experienced in tool development is a must. Schlumberger, Apex and Synice all have first-class expert system shell developers

In my case story. I do not believe that Genesis could meet this requirement. Re-member, the company staffed experienced conventional programmers rather than AI tool developers.

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Although both Apex and Syntelligence have been successful in expert system shell development. I would recommend that all expert system developers avoid developing their own tools for as long as There is little to say about Genesis's

first option: to purchase a relatively inexpensive expert system shell and negotiate a proper price for the runtime environment at the time of the tool's purchase. Genesis needed a cost-effective runtime nent, that's all.

The following lesson is one that is very inortant:

Lesson 6. A critical part of shopping for on appropriate expert system shell is finding out whether it has a separate runtime environment and how this enstronment con solve your runtime prob

The ideal solution to one's runtime ms would probably be a cross-compiler that could compile the expert system code written in an Al language, such as LISP, into a conventional programming language of one's choice. This choice could be dictated, for instance, by a specific conventional software to which one's expert system should be hooked up. Un fortunately, all expert system shells that I am aware of do not have such cross-com-

pilers Indeed many expert system shells have interfaces to one or more conven tional programming languages so that the

expert system can call programs written in those languages Although this feature is very important, it does not really help to execute the expert system cost-effectively and effi-

Cost-effective runtime environments are a big problem for commercial expert system development. The problem becomes critical if you are to choose a high level expert system development tool The price may be high, and it is paying for things that are used during develope and are hardly needed at the execution time. Lock for the solution of this problem before you buy the expert system shell

Users interested in developing expert systems of their own should take heed of

following lessons: . The scope of an expert system's expe tise and its running time are equally important to the system's performance · Unless a system's scope of expertise is increased in accordance with efficiency requirements, its scope of expertise and runtime will be conversely related. · An expert aystem shell should provide end-user-oriented facilities for easy incorporation of control strategies and should be supported commercially.

· An expert aystem shell should never be developed if a commercial one can be found that is adequate for the application · A critical part of shopping for an appropriate expert system shell is finding out whether it has a separate runtime environment and how this environment can e runtime problems.

The story of Genesis's struggle to develop an expert system shows that selection of a proper expert system shell can be critical to the success of an expert system development project. To handle this process properly, users should know much more than what they glean from vendor advertisements and promotional litera-

## PROMISES KEPT, PROMISES TO KEEP.

At the beginning of Athin century, Theodore N. Vail, president of AT&T. understood his competition not just as other telephone companies, but as distance, not concluded the geometric could end the group could be assured. The vision that the group could be group coul

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# The politics of technical writing

#### BY PAUL A BELL

se written in sup port of software, are ost often reviewed as art of the products hey describe. publications contribute not only to the product image but also to the company operations by decreasing the need for mainte-

nance and hot-line calls. ten fail, because technical companies tend to take the technical view: They expect a writer to act as a straight line of communica tion from source — the development staff - to destination

Along the line somewhere schedules are to be set and reset according to the performance of technical development, and when the product is ready to enter production, a set of glossy publications will accompany it. The problem with the technical view is that the technological wonders of desktop publishing

do not automatically produce good publications. Publications are produced by people, and where there are people, there are politics. To supply the best documentation in the time allotted, the company must rely on a top-down network of people each group a constituency, each individual a political entity. At each level of this hierarchy, the principles of Murphy's law come

Top dogs At Leading Etch Corp., the vicepresident of marketing, a selfmade man who was proud of his

Bell is manager of technical publica-tions at Silicon Compilers, Inc. in San



handiwork, didn't think that writing was important to the success of his product until he received a letter from State of the

'If you are so careless about the quality of your correspon-dence," the letter's author said. "then I am too concerned about the quality assurance checks throughout your company to agree to this contract." In the envelope, alone with an unsigned contract, was a red-lined copy of e vice-president's letter to

Though many decision makers would not recognize a grammatical slip or sloppy punctua-tion — and those who do would not generally take the time to write about it - their judgments

can be influenced by the written

As is true of the success of

most company projects, the im-petus for good documentation

must come from the top Executives must be con rinced that professional publica tions are significant to the quali ty of the company's image and must transmit that conviction to

the people who can contribute.

In order to bridge the credibil ity gap and pay more than just lip service to the need for effective communication, memos and announcements from the top must be well written A comma splice or dangling

modifier might seem to be a fussy detail, but good engineers and programmers know the importance of detail in their own work; details are equally important at the too. Because examples of poor ex-

ecutive prose abound, the prose is often parodied. Well-written documents, whether issued directly from the nowers that be or filtered through a competent secretary, establish credibility. Executives who practice what they preach will be able to lead more disciples to the cause of

The governors At the Salem Kindling Cn., proj-

ect postmortems often end up as witch hunts. Managers who have forgotten to take into account all the support needed - such as the inclusion of publications in the schedule — to turn out a quality product end up pointing fingers at each other for the oversights. Hard feelings from one project carry over to the

Management time spent defining the interactions between people is as important as time spent defining the interfaces of the product. Although no one would want to compromise the publications because of untested information or inadequate editing time, too many managers (a) to see beyond the traditional par ty lines of product development

Technology no guarantee of good publications

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So it's not surprising that FORTUNE magazine named the COMPAQ DESKPRO 386 one of the most significant products of 1986.
As did Business Week.

Venture magazine proclaimed the COMPAQ DESKPRO 386 one of the year's best entrepreneurial ideas. And PC Magazine highlighted it as a product of the year, while singling it out for technical excellence in the desktop class.

## The critics rave

The COMPAQ DESKPRO 386 is also winning critical acclaim from indus-

try experts.

PC Magazine noted: "The
COMPAQ DESKPRO 386 does it with class, with speed and with sound hardware and software design. In a market where it often takes a few tries to get a new product right, Compaq has clearly done

it right the first time."

USA TODAY reported that the
COMPAQ DESKPRO 386 "marks a new generation of PC's that will make previous desktop models look like

Almost every major industry and news publication reacted the same. Ditto for users.

## Blockbusting sales

COMPAO DESKPRO 386 sales are surpassing expectations, as thousands of users are putting it to work immediately. To run productivity software. For CAD/CAE applications. Software development. And as network file servers for businesses

The most advanced personal computer in the world



It's no wonder. We designed the COMPAQ DESKPRO 386 with dozens of enhancements that put it in a class by itself. Feature presentation

The high-speed, 32-bit, 16-MHz, Intel\* 80386 microprocessor lets you run today's software two to three times faster than ever. Plus it opens doors to applications never possible before on a PC.

possible before on a PC.

Compaq enhanced each component to optimize power and speed,
without sacrificing compatibility,
giving you the most advancements
ever engineered into an industrystandard PC.

A memory management system

that breaks the 640-Kbyte barrier of current operating systems. More storage with faster access. More expandability. More connectivity. Simply more power for more people to do more things.

Add it up and the COMPAQ DESKPRO 386 is the first desktop PC to give you a true minicomputer level of performance. And that sets the precedent by which all future advanced-technology computers will be judged.

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So while some may copy its engine, none will duplicate the uncompromising performance built into the COMPAQ DESKPRO 386. It's that firm refusal to settle for compromises that makes every Compaq personal computer best in its class.

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DESKIPRO **385** 

#### and support.

Of course, some people in the organiza-tion are more critical to the product than others, but resource rights need to be parceled out to all and renegotiated in times of conflicting goals. Ignoring all but the development staff leads to resentful employees who are less able to concentrate on the task at hand after losing face.

For publications to be accurate, timely and reflective of a professional company image, the people who directly and indi-rectly contribute to a product's success must negotiate at all stages of the product life cycle. Discussions about the kinds and numbers of documents that the product will require should start with the initial

LTHOUGH a few technical people are superb writers, most are not. Managers who assign development personnel to documentation tasks run the risk of second-rate publications at the expense of full-time development - a double bind.

writing should begin, at least on a parttime basis. Although it is possible that having writers get close to a product design can sometimes compromise their view of what the users will need to know, the risk is negligible when compared with the benefits of their understanding how

the product will work. ng of the project. Publications that evolve with repeti-mediately thereafter, technical tions of design phases, sudden shifts be-

cause of technical difficulties, reworking of unworkable features, multiple rever-sals, large and small, are the better for being a part of the process.

Ditto for the writers who get a stronger grounding in their subject matter and the developers who are able to concentrate more on the design and less on its documentation. Mutual respect for one another's expertise very often results

from this process and makes the next proj

ect easier to manage.
Few good products go out the door without a page of last-minute release notes, covering from the time the publication went into print until the tape is shipped or the last nail is pounded into the shipping crate. Project, program and departmental managers who consider all facets of product success should include publications in their schedules from benine to end

Conflict of interest At Barnes and Fields, much of the writing At Barnes and helds, much of the writing is farmed out. This contract work is cheaper, in these times of shrinking budgets, than employing full-time writers. The quality of the writing is uneven, however, depending on the availability of competent contractors and the amount the

company is willing to pay.

At Matrix Machines Corp., all writing is done in-house, with each major develop-ment project including one team member responsible for documentation. The quality of the writing among projects is un think they are writers are not and when engineers who do not want to write are forced todoso

Whether managers in charge of techni-cal writing decide that their writing staff will be predominantly contract or captive, distributed or consolidated, they must be sure that all writers have basic writing

Some technical types have written not only technical articles but everything from poetry to science fiction. These people are to be encouraged, as their input generally needs only light editing and clar-ification. However, the scope of their con-tributions should not expand to the detri-ment of their technical tasks.

Just as an engineer must understand material properties or a systems pro-grammer must understand console modes, a competent technical writer should understand how to use rhetorical devices to achieve the most elegant and proper solutions. Understanding grammar, its use and structure, is basic to all good writing. Since most technical writers are learning with each new assists ment, there's no time to be learning th basics, too

Although a few technical pe perb writers, most are not. Managers who assign development personnel to documentation tasks run the risk of sec nd-rate publications at the expense

Ronk and file

At Wild Blue Yonder Spacecraft, Ltd., the program developer sees no good reason to waste time with a tech writer when the way the product works is totally evident from comments in the code. The design engineer, meanwhile, has become im-mersed in the next project, which is much more interesting one and will give him better visibility. How is the writer to

In addition to rhetorical skills, technical writers need to interact effectively with many types of highly professional personnel: engineers, programmers, mathematicians, technicians and management throughout the company.

In The Psychology of Computer Pro-gramming, (Van Nostrand Reinhold, 1971), Gerald Weinberg makes this observation

The users have a right to expect that



the documentation be done as professionally as the programming. And considering the matter coolly, there is no reason to beheve that a professional programmer will be qualified as a professional documenter. If documentation is elevated to a prossional status all its own, so that the doc-

umenter can work side by side with the programmer without being made to feel inferior, we have the right to hope that currentation will improve."
Although WYSIWYG, windows and

mice have certainly led to better looking publications, documentation content has not improved dramatically since 1971, rinberg wrote the above evaluation, fully realizing later that he was describing a political climate:

"And so, when we speak about computer program documentation, we are not speaking about the psychology of comput-er programming at all, except insofar as programmers have the illusion that any-one can do a good job of documentation, provided he is not smart enough to be a

and competitive

The competition But many developers and writers still do not realize the commonality inherent in their two disciplines. The most important techniques of designing quality products — that is, coherent logical structure and strict adherence to detail - apply equally

to writing "How strange it is," Samuel Florman ses in The Existential Pleass Engineering (St. Martin's Press, 1975), at the antitechnologists . . . who readi ly accept the behavior of leopards and vul-tures are repelled by the idea that man, for all his angelic qualities, is self-seeking

On every development project, no matter how dedicated, everyone must compete for the most limited of resources: other people's time. One way to save time is to agree on common term

ology early in the project. Since no one has yet written The Exis-tential Psychology of Technical Writers, it is primarily the writer's job to understand developers who run the gamut from polished presenters to those who can barely speak English.

Because most people on one project generally have not come from the same company, the writer cannot assume that a



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lousands of custo ed a low cost con-formation into the stem can read and write sur 3%-75% 76" distretes. We manufacture many hardware roducts and have developed undreds of programs. For product iformation can 602-779-3341. specific technical term is standard without checking with at least two other peoole in the same discipline, preferably from different companies. Their mother-comany cultures, as well as their diverse dis-

es, add spice to the political stew. Everybody must agree on terms and use them in all documentation, from electronic mail memos through publication release. This is the only way to ensure consistency, a quality that is not only a sure gauge of the final publication but also a ive aid to int

The producers At Xoxix X-Ray Equipment, everyone in The production department is threat-ened and cajoled by marketing to get the

sies out, by technical pubs to get the manuals copied, by training to get the slides inked and by the president to get the latest version of his speech re-type-

Production issues must be talked out until responsibilities are assigned for set-ting quality standards, establishing priorities with enough flexibility to handle crunches and designing tracking systems

ALTs-ing persons
ALThe Fast Lane Corp., the company system goes into gridlock when a manual is due. If the company had purchased independent desktop publishing of some form for its technical publications department, the problem would be minimal. However,

this department uses a distributed system that is shared throughout the company, and MIS involvement in documentation ication support is almost nonexistent

When writers are part of a network of computer users, a good relationship between publications and MIS operations is critical. The systems administrator must understand what the system's editing and text formatting software does in order to help the writers tailor the system's writing tools to their needs and to troubleshoot the inherent or resultant bugs. The writers must visit the operations

facilities and get an idea of its equ

and complexity in order to help in the MIS

bailiwick. By understanding how much of

a strain a multivolume document puts on



on the other users, writers can learn to give advance warning to everyone con-cerned. MIS and publication managers who are aware of each other's needs and who meet regularly can keep automated and human systems running with fewer

Training wheels At Convergent Compilers Corp., the comany training department and the technical publications department report to the same branch in the organization chart. They could benefit from each other's research; instead, they operate indepen

ntly and redundantly - and their cusmers are confused. Coordinating training materials with e documentation effort can only im-

HEN THE draft appears on time but as clean as it went out - except maybe for a typo or two that the reviewer has spotted - the reason is most likely not a perfect manual but rather a reviewer whose manager has not made it clear that publications are important.

prove both, and there's nothing strange about the two departments becoming bedfellows. They share the common goal ething that someon of teaching so needs to know. They can share the work load, too, especially in development of epts and illustrations. It's essential

that they share a common dictionary of Their constituencies do diverge in the

formalisms of presentation. But the more the manuals support the training as refer-ence material, the more the training can help users recall the information in the

Roving reviewers
At all companies, the politics of documentation can become especially heated during review cycles, when publication drafts

single draft before final editing and pro-

The distribution list attached to the draft can also serve as a sign-off sheet. A sheet of instructions should be attached telling the reviewers what is expected of them in terms of time and types of corrections and highlighting any parts of the ablication that are still incomplete. Rerws should act as a check not only on

st be critiqued by developers, market-

ing staff, customer service personnel, lity controllers and lawyers, any or all

of whom woo't agree with parts of the

publication or with each other and few of

whom will acknowledge limits to their

Review drafts must be prepared, dis-tributed, collected and incorporated into a

what is there but also on what is missing. To avoid anarchy, revolution and territorial imperatives, a strategy must be deed to mediate among the following: · Reviewers who return copies late, a touched or not at all

· Marketers who sometimes learn from the review draft that features they were touting didn't make it into the product af-· Managers who have published articles

— generally very heavily edited — in trade journals and decide the tone of the is somehow wrong . The company lawyer, who has just discovered that the product name has al-

ready been registered by another compo-ny in the same industry. The primary rule in this strategy is al

There is always time to give everyone responsible for signing off the final review

draft a preliminary view of its contents. The second rule is review the review. When the critical draft has not been re rned within the specified time, it is gen erally the writer's responsibility to track

that draft down, often to the bottom of a pile of program listings or engineering hen the draft appears on time but as clean as it went out - except maybe for a typo or two that the reviewer has spotted the reason is most likely not a perfect

manual but rather a reviewer whose manager has not made it clear that publicaas are important by providing the perus Previewing the final draft, fixing a firm date for its return, tracking it by remind-ers and rewards and applying quality assurrance measures before it is cast in con-

crete are the ways to make a review Everybody wins Good publications speak well for the comues that view the written word as a sig

nificant contributor to the company image. If a company's publications do not rk well, then its customers may neve find out how really well the product

Good publications can be produced only when everyone in the organization remembers that everyone else is subject

the same pressures. Good publications are good com sense. They make the job easier for everyone - the prospective customer who needs data to make a buy decision, the marketer or salesman who needs every selling tool available, the developers and service personnel who must maintain the system, the writer who will be writing more about the same product or others

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word, good or bad.

## MANAGEMENT

#### TAKING HARGE

## Mark Duncan

## Glamorize maintenance

Since existing application software may be likered to company assets, when something goes wrong the whole company can be affected, not simply the data processing department that maintains the program code. Therefore, maintenance must be regarded as a business issue. The highest levels of both data

regarded as a business issue. The highest levels of both data processing and user department management should develop a keen swareness of the impact of maintenance activities, and they must do more than support it, they must fain for it. Maintenance should no long-

Maintenance should no longere be regarded as something less significant than development. It must be elevated to share an equal position with development. An organization should certainly maintain commercial competitiveness through new and effective computer automation. But when new automation grows old, longevity and client credibility will only be achieved with an established or and successful maintenance proand successful maintenance pro-

gram.
Generally, an application spends more of its life being maintained than it does being developed, which suggests that perhaps maintenance should be considered more important than

velopment. But this is Continued on barr 7

## Firm taps Mac for strategy move

BY JEFFRY BEELER CWATGE SANTA BARBARA, Calif.

When Kinko's Copies Corp. began equipping its outlets with microcomputers and using them to deliver desktop publishing services, the company did a lot more than simply diversify its busi-

ness.
Without realizing it, the nationwide chain of walk-in photocopying shops was also providing a textbook example of how corporations systematically mature in their ability to recognize and exploit information technology

In adopting systems, most or-

two-stage learning curve, according to Jack Nilles, information technology program director at the University of Southern Calfornia's Center for Futures Research. During the first stage, compa-

During the first stage, companies typically apply high technology to existing procedures in the hope of brightening their profit picture by boosting productivity or slicing costs. Nilles said. In short, they initially limit their use of computing systems to

short, they initially limit their use of computing systems to tasks they already do.

As their experience in using the newfangled technology

awaken to its other possibilities and begin adapting it to enterprises they have never before tried, Nilles continued. During this second phase of the learning curve, they use systems experises not only to save money but also to make it, either through deventification or expansion to new geographical markets.

A striking libestration of how

geographical markets.

A striking illustration of how corporations can tap additional revenue sources by shrewdy using information technology is Kinko'a Copies' move in 1985 into deaktop publishing. Nilles

said.
Founded in Santa Barbara in 1970. Kinko's Copies originally viewed itself sincity as a docu-viewed itself sincity as a docu-viewed itself sincity as a docu-viewed itself sincity as a document of the sincity of

fering a low-end alternative to typesetting in the document-duplication market," according to Charley Williams, vice-president of marketing for Kinko'a Service Corp., the photocopying chain's support arm. To capitalize on what it con-

sidered an emerging business opportunity, the firm began to install typewriters in its copy shops and firted with a number Continued on page 70

## Telecom salaries jacked up

BY DAVID A. LUDLUM

Starting salaries for telecommunications managers this year
are growing more than twice as
fast as those for other information systems positions, accordingto an amenial survey.

Starting salaries for telecommunications managers in large data processing installations are rising 15.4% while those in medium-size shops are growing 17.1%, according to an annual survey by Robert Half Interna-

tional, Inc.

The survey is based on starting salaries for personnel sought through the nationwide offices of the recruiting firm, which has followed data processing pay lev-

els since 1950.

Most jobs at large installations — characterized in part by a professional staff of 50 or more — show gains of 5% to 8%. The second-largest increase is 9.5% for systems and programming

Most jobs at medium-size installations, those with 15 to 49 professionals, and small shops, with fewer than 15 professionals, show increases of 2% to 6%. The second-largest gain for positions in a medium-size shop is 8.5% for programmers.

The big premium in increases for telecommunications managers reflects their scarcity, in re-Continued on page 74

## Data View

Corporate departments targeted for automation



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## Firm taps

CONTINUED FROM PAGE 69

of other neocomputerized means of producting original documents. However, as personal computers increased steadily in acceptance and sophistication, Kindo's Copies shandoned its earlier choices and embraced decktop publishing as the prime whick for pursuing its planned expunsion.

The idea for placing deaktop publishing

systems in its stores took shape collectively in the minds of a small team of Kin-ko's Copies managers that included Williams and Ed Togami, vice-president for technology at Kinko's Service.

At first, Kinko's Copies considered im-

INKO'S Copies' desktop publishing services come in two flavors, including a do-it-yourself variety in which customers rent time on a Macintosh and create their own documents without help from the company's employees.

plementing its desktop publishing aystems on IBM Personal Computer clones. But acting primarily on Togami's advice, the organization opted instead to build the service around the Apple Computer, Inc.

Having been a Macintosh user himself since 1984, Togami was especially smitten with the machine's user interface, which he found much easier to learn than

its Microsoft Corp. MS-DOS counterpart
s. and, therefore, more sustable for nontechential customers. "Ease of use was a key
the consideration in our recommendation
cabout what computer model to install out
in the field," Togami recalled.
Kinko's Copies' desktop publishing

Kinko'a Copies' desktop publishing services come in two flavors, including a do-it-yourself variety in which customers merely rent time on a Macintosh and cre-

ate their own documents without help from the company's employees. In configuring its deaktop publishing systems, the firm needed a microcomputer that required as little user training as possible,

Togami said.

Another reason Togami, the support firm's chief MIS executive, favored the Macintosh over IBM-style PCs is that it allows customers to turn their finished documents into output that is high in quality — and thus readily reproducible — us-

ing Apple's Laserwriter printer.

During the nearly two years since it went into operation, Kinko's Copies' desktop publishing service has found its way into almost a third of the company's roughly '300 photocopying outlets, Togami said.

accounts for only about 1% to 2% of the chain's total business, executives of the corporation expect the share to climb to as high as 10% within two years, Williams said

CALENDAR

#### FEBRUARY 22-28

Electronic Printing Systems/Directions in Digital Imaging Conference, Miams, Feb. 22-26 — Contact Electronic Printing Systems, Directions in Digital Imaging, Suite 1, 1855 E. Vista Way, Vista, Calif. 92084.

1987 User Group Conference, Marina del Rey, Calif., Feb. 22-25 — Contact: Trax Software, Inc., 10801 National Blvd., Los Angeles, Calif. 90064.

Dave, Los Angeles, Lan. 30004.

Automating Systemis Analysis and
Design. St. Paul, Misn., Feb. 23-25 —
Contact: Association for Systems Management, 24567 Balgly Road, Cieveland,
Ohio 44138. Also being held in Des
Moines, Jowas, Lansing, Mok.; Austin,
Texas; Toronto; Boston: Kansas City,
Mo; and Toledo, Ohio.

International Operational Data Security Workshop. Stamford, Conn., Feb. 23-26. Contact: Information Security Associates, Inc., 350 Fairfield Ave., Stamford, Conn. 66902. Also being held March 9-12 in Houston, April 27-30 in Toronto, May 18-21 in Orlando, Fla. and June 1-4 in Minnespolis.

The National Local-Area Network Conference, Washington, D.C., Feb. 23-26 — Contact: Ken Burroughs, Capital Communications Group, Inc., 3825-1 South George Mason Drive, Falls Church, Va. 2004.1

Exchange Carriera Standards Association Technical Subcommittee T1Q1. Orlando, Fla., Feb. 23-27 — Contact: Radisson Plaza Hotel Orlando, 60 S. Ivanhoe Blvd., Orlando, Fla. 32804.

IBM: Mastering the Transition 1987-1992. New York, Feb. 24-25 — Contact: The Yankee Group, Seminar Division; 200 Portland St., Boston, Mass. 02114.

Competing With Computing. Dallas, Feb. 24 — Contact: Education Registrar, Nolan, Norton & Co., One Cranberry Hill, Lexington, Mass. 02173. Continued on page 75

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ie-stop accountability. We'll be NetOne The Free Enterprise System.

## Glamorize

not so — it is not a case of one being more important than the other. It is a case of both functions being given due attention at the proper time. A good maintenance program will improve the development life cycle, and a good development life cycle will reduce maintenance

Since maintenance demands a large portion of the data processing budget — and will probably demand even more in the future — management must recognize that it needs maintenance specialists.

These creatures are not the same as development programmers who occasionally perform maintenance. They are a breed spart; they have substantial knowledge of many applications and their interfaces as well as a greater awareness of the impact on users and the company's business of things go wrong.

on users and the company's business if things go wrong, in other words, maintenance programming is a career, and data processing management must acknowledge it as such. Maintenance programming should be offered as an equal alternative to development proing it as a career should feel reassured that time, money and training will be expended on the maintenance staff with the same generosity as it is on development teams.

Data processing management must acknowledge that there are such things as maintenance skills and that these skills are not necessarily the same as development skills.

#### Acquiring skills Furthermore, acquisition of th skills differs. Whereas funding

saus outers. Whereas tribung for development education and training seems to be an automatic to badget consideration, the same is not true with maintenance. There seems to be an inexplicable expectation that people magically become maintenance programmers simply by being assigned that title

or responsiousy.
Time must be formally allocated for mastering existing applications. Through this training, maintenance programmers, will develop a confidence that prevents software corrections and modifications from being a

and modifications from being a hit-or-miss activity.

There is no denying that to be successful, both development and maintenance programmers must be technically competent. Furthermore, technical skills

are common to both activities: development and maintenance programmers must have the ability to write, test and debug code, they must have analytical and documentation skills, they must be knowledgeable about their hardware and software and so or

Development and maintenance programmers also require a number of nontechnical skills

AINTEN-ANCE programming is a career, and data processing management must acknowledge it as such.

However, the nature of maintenance tends to demand these nontechnical skills to a greater degree than does development. These nontechnical skills

These nontechnical skills and their importance to mainte nance include:

Initiative, due to time constraints and lack of procedures.

Self-sufficiency, because

work is often vaguely defined and done alone. • Versatility, because in many cases several applications must  Flexibility, because projects may have many aspects and grow in scope.

wheticulousness, due to unfamilar code and applications.

This is not meant to suggest that a particular skill is unsupe to either development or maintenance. In fact, the more overlapequire there is, the better, for it will draw the activities closer together, making maintenance more

like extended development, Despite a plethon of productivity aids and tools to make the development process faster and more streamlined, mainteman extivities are going to claim the emphasis in data processing departments of the fature. Whereas development is in variably optional, maintenance

The current obsession with quality in the context of application development is a clear indication of data processing management beginning to take

## Fact of life

However, there will never be perfectly developed software, so maintenance will always be a fact of data processing life. And for that reason, maintenance programming needs to be accepted for the important function it is. The perception has been that a development project is somehow more visible than a maintenance project, yet it is maintenance work that interrupts development, not the

terrupts oevesopment, not the reverse.

Data processing manage-ment needs to glamorize maintenance activity in order to attract programmers with genuine interest in, ambition for and desication to the function. An easy first step would be to ban the word maintenance stelf, as it carries with it connotations that stem mainly from what development is not, rather than from what maintenance is.

from what misistenance is. Instead of misintenance, why not say extended development or even complementary development. Instead of maintenance programmers, we could havesystem troubleshooters or a dynamic support group.

Connetic changes will help, but only when data processing management begins to concern itself less with the romance of development and more with the resisty of maintenance will the latter receive the recognition and attention it legitimately deservers.

Duncan is a systems analyst in the Quality Assurance section of a major Dallas back.

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ogy and applications.

## Telecom

FROM PAGE 69

lation to demand, and an effort to raise the salaries to the level of other information systems man-agers, according to Joan Gable, manager of Robert Half's data processing placement depart-

"There are not that many of them out there. It's a relatively new position," Gable said, adding that some companies are resultants with full-time

sultants with full-time employees.
The average salary reported for large-shop telecommunications managers is \$45,000 for data base managers, \$47,000 for chiral base managers, \$47,000 for chiral parties managers, \$47,000 for the chiral parties ical services managers and \$46,000 for systems and pro-

The average salary reported for telecommunications manag-ers at medium-size shops is \$41,000, which compares with \$42,500 for technical services managers, \$41,000 for systems and programming managers and \$39,000 for data base managers.

New monogors New telecommunications man-agers tend to have at least a year agers tend to mave a consider of experience in that field, acor experience in that field, ac-cording to Gable.

While an MIS director who

came up through the data pro-cessing ranks might be able to bring most of his new managers up to speed through his experi-ence, he probably cannot do so for his new telecommunications manager, Gable said. Employers manager, Gable said Employers do not consider managers as transferable among technical ar-eas as they once did, she added. The demand for telecom-munications experience extends

to small, personal computer-ori-ented shops, Gable noted. "It's getting down to even the micro shops. People who have PCs are looking for someone who has modem experience," she said.

Filling jobs
College students increasingly specialize in telecommunications; in the long run those who have done so will fill many teleunications jobs, Gable said. Among large installations, starting salaries for 16 of the 23

data processing positions listed are up between 5% and 8%. The others with larger gains

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are operators at 8.8% and opera-tions managers at 8.6%. Posi-tions with smaller increases are telecommunications specialists

2% and 6%, except I/O clerks, which registered no change.

at 4.2%, programmer analysts at mer analysts', which rose 1.8%.
I/O clerks showed no change.
The survey notes that start-3.3%, data entry operators at 1.6% and I/O clerks at 1.3%. Among the 22 jobs listed for medium-size installations, all the others show gains of between ing salaries can vary significantly on the basis of an individual's ex-

positions listed show gains of 2% to 6%, except MIS directors', which rose 6.5%, operators', which rose 6.3%, and programdo not apply to salaries of

To compensate for geographical variations, the survey provides figures for adjusting averages askirs by state. It also suggests adding 5% for jobs in cities of one million or more people. However, these variations

\$50,000 or more. Among the states for which salaries should be adjusted up-ward are California, Massachustates with average salaries.

ection (5%): New

setts and Connecticut (5%): New York (4%); Illinois and Michigan (3%); New Jersey and Washing-ton (2%); and Minnesota (1%). Among those for which they should be adjusted downward are Maryland, Ohio and Texas (1%); Virginia (2%); Colorado (3%); Georgia (4%); North Carolina (8%), and Arizona and Florida (9%). Pennsylvania is among

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#### MANAGEMENT

ntinued from page 70 mputer Aided Software gineering Symposium. At-ta, Feb. 24-26 — Contact:

Software Institute of America, Inc., 8 Windsor St., Andover,

tact: SCI Software, 1255 N. Van-

Phoenix Conference on Computers and Communica-tions. Scottsdale, Arix., Feb. 25-27 — Contact: Arisona State University, College of Engineer-ing and Applied Sciences, Tem-Third Annual Champa Us-ers' Group Meeting. Crystal River, Fla., Feb. 25-27 — Coning and Applied pe, Ariz. 85287

troduction to EDP Perfor-

tage Point Drive, Crystal River, Fla. 32629.

mance/Capacity Manage-ment. Phoenix, Feb. 25-27 — Contact: Applied Computer Re-search, Inc., P.O. Box 9280, Phoenix, Ariz. 85068.

ICIA '87/Commtex Interna-tional. Atlanta, Feb. 25-28 — Contact: International Commu-nications Industries Association, 3150 Spring St., Fairfax, Va.

X/Open Demonstration of Portability. Luxemburg. Feb. 26 — Contact: Christina Davis, X/Open Office, Sterling Public Relations, 1 Chelsea Manor Gar-dens, London, England SW3.

MARCH 1-7

Second International Con-ference on CD ROM. Scattle, March 2-3 — Contact: Micro-

soft Corp., Box 97017, 16011 N.E. 36th Way, Redmond, Wash. 98073

Seventh Annual Computer Operations Conference. New Orleans, March 2-5 — Contact: Association for Computer Operations Management, Suite 201, 11501 Brookhurst, Garden Grove, Calif. 92640.

Eighth Annual Conference on EDP Performance and Capacity Management. Phoenix, March 2-6 — Contact: Applied Computer Research, Inc., P.O. Box 9280, Phoenix, Ariz. 85068.

CICS/VS Command Level Programming Course. Edi-son, N.J., March 2-6 — Contact: Branch Manager, Suite 207, One Metroplaza, Edison, N.J. 08837.

Corporate Electronic Publishing Systems Show and Conference. Chicago, March 3-5 — Contact: Cahners Exposition Group. 999 Summer St., Stamford, Conn. 06905.

DEXPO Europe '87. London, March 3-5 — Contact: Expocon-sul International, 3 Indepen-dence Way, Princeton, N.J.

ecuricom '87 Congress on Computer and Communica-tions Security and Protec-tion. Paris, March 4-6 — Contact: Securicom-Sedep, 8 rue de la Michodiere, 75002 Paris.

Data Communications Net-work Management. Boston, March 5-6 — Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held April 30 to May 1 in Seattle.

Property. Chicago, March 5-6

Contact: Deborah Gordon
Public Relations, Inc., 320 N.
Michigan Ave., Chicago, IE.
60601. of Intellectual

## MARCH 8-14

Cullinet Applications and End-User Computing Con-ference. Dallas, March 8-10 — Contact: Cullinet Software, Inc., 400 Blue Hill Drive, Westwood,

Continued on page 77

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Continued from page 75 -Spring 1987 Conference of the North American Honeywell Usera Association. Charleston, S.C., March 8-13 — Contact: NAHU, Inc., P.O. Box 2037, Willingboro, N.J. 08046.

CICS/VS Internal Structures & Con-trol Flows. Atlanta, March 9 — Contact: rican Data Group, Inc., 1770 Indian Trifl Road, Norcross, Ga. 30093. Also b ing held May 11 in Philadelphia.

Automated Manufacturing: Computers, Communications and Controls in the Factory. St. Petersburg Beach, Fla., March 9-10 — Contact: Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y., 10038.

New Technologies. Beverly Hills. Calif., March 9-10 — Contact: Seybold Seminars, 6922 Wildlife Road, Malibu,

CAD/CAM, CAE Executive Workshops '87. Cambridge, Mass., March 9-10 — Contact: Cynthia Wolfram, Dara-tech, Inc., 16 Myrtle Ave., Cambridge, Mass. 02138.

Electronic Banking: The Challenges of Tomorrow's Bank Within Yester-day's Legal Framework. Brussels, March 9-10 — Contact: Alan Galsski, Conference Office Brussels, 19 rue de l'Orme. B-1040 Bruss

11th Annual BRS User Meeting. Kannas City, Mo., March 9-10 — Contact: BRS Information Technologies, 1200 Route 7, Latham, N.Y. 12110.

Computer Technology and the Law: Protecting Your Rights. Arlington, Va., March 9-11 — Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

Federal Office Systems Expo. Washington, D.C., March 9-12 — Contact: National Trade Productions, Inc., Suite 400, 2111 Eisenhower Ave., Alexandria, Va.

Effective Management Skills for the MIS Manager. Cambridge, Mass., March 9-12 — Contact: American Manrement Association, 135 West 50th St., w York, N.Y. 10020.

Open Network Architecture: Computer III Status Report. Arlington, Va., March 10-11 — Contact: Philips Publishing, Inc., 7811 Montrose Road, Potomac, Md. 20854.

on East. New York, March 10-12 - Contact: Linda Morris, Corpcon, P.O. Box 3727, Santa Monica, Calif. 90403.

Software Performance Engineering, Denver, March 10-13 — Contact: Performance Engineering Services, Dept. 120, P.O. Box 9802, Austin, Texas 78766. Also being held June 2-5 in Washington, D.C.

Optical Information Systems. Long Beach, Calif., March 11-13 — Contact: Meckler Publishing, 11 Ferry Lane W., Westport. Conn. 06880.

# MARCH 15-21.

The 1987 National Automated FEBRUARY 16, 1987

Clearing House Association Conference. San Diego, March 15-18 — Contact: NACHA, Suite 640, 1901 L St. N.W., Washington, D.C. 20036.

Fifth Annual Computer Based Train ing Conference and Exposition. At-lanta. March 15-18 — Contact; Julia Stao, Conference Registrar, Weings

Publications, Inc., 38 Chauncy St., Bos Guide International. Ansheim, Calif., March 15-20 — Contact: Guide Head-guarters, 111 E. Wacker Drive, Chicago,

Software Quality Assurance. Los Angeles, March 16-17 — Contact: U.S. Pro-

fessional Development Institute, Suite 221, 1734 Elton Road, Silver Spring, Md.

1987 West Coast Manufacturing, Accounting and Production Informa-tion Control System Users Confer-ence. San Diego, March 16-17 — Con-tact: Salem Corp., 1654 Poplar Lane. Annapolis, Md. 21401.

Artificial Intelligence and Expert Systems. Cleveland, March 16-17 — Contact: Association for Systems Man-agement, 24587 Bagley Road, Cleveland, Onio 44138. Also being held in Louisville, Ky., Dayton, Ohio, Portland, Ore., Fort Worth, Texas, Baltimore, Richmond, Va., Concord, Calif., and Tulsa, Okla.

Fifth National Conference on Mea suring Data Processing Quality and Productivity, Orlando, Fla., March 16-18 - Cont: t: Quality Assurance Insti tute, 9222 Bay Point Drive, Orlando, Fla. 32819

Electronic Data Processing Audit Managers' Roundup III. Orlando, Fla., March 16-19 — Contact: MIS Training Institute, 4 Brewster Road, Framingham, er 01701

TCP/IP Interoperability Conference. Monterey, Calif., March 16-19 — Contact: Advanced Computing Environments, 21370 Vas Ave., Cupertino, Calif.

Continued on page 78



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Continued from page 77 Tutorial Week. Kissimme Fla., March 16-20 — Contac Computer Society of IEEE, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

Open Systems Interconnec-tion. Washington, D.C., March 16-20 — Contact: The Omnicom Institute, Omnicom, Inc., 501 Church St. NE, Vienna, Va. 22180. Also being held April 27-May 1 in Minneapolis.

Workshop on Factory Com-munications. Gaithersburg, Md., March 17-18 — Contact: Robert Rosenthal, B217 Tech-nology Building, National Bu-reau of Standards, Gaithersburg, 15222

The Fifth Technology Op-portunity Conference on Op-tical Storage of Documents and Images. Washington, D.C., March 17-19 — Contact: Rothchild Consultants, 256 Laguna Honda Blvd., San Francisco. Calif. 94116.

The National Association of Bank Servicers Semiannual Meeting. Tamps, Fla., March 17-20 — Contact: National Association of Bank Servicers, Suite B. 5008 Pine Creek Drive, terville. Ohio 43081

The International Phoenix User Group Meeting, Atlanta, March 18-19 — Contact: Livingston and Associates, P.O. Box 30619, Cleveland, Ohio 44130.

78

Testing Computer Software. Los Angeles, March 18-20 — Contact U.S. Professional De-velopment Institute, Suite 221, 1734 Elton Road, Silver Spring,

1987 Template User Net-work (TUN) Annual Confer-ence. Arington, Va., March 18-20 — Contact: Template, 9645 Scranton Road, San Diego, Calif.

Innovative Systems 1987 User Group Conference. San Francisco, March 18-20 — Con-

# MARCH 22-28

Electronic Computing Health Oriented (ECHO). Hot Springs, Va., March 22-25 — Contact: Electronic Computing Health Oriented, 10401 Fern-wood Road, Bethesda, Md.

**National Computer Graphics** Association's Computer Graphics '87: Applications for Excellence. Philadelphia, March 22-26 — Contact: National Computer Graphics Asso-ciation, Suite 200, 2722 Merri-lee Drive, Fairfax, Va. 22031.

Managing the Information Resource, Los Angeles, March 22-27 — Contact: Nolan, Norton & Co., One Cranberry Hill, Lexington, Mass. 02173.

Sixth Annual International Spectrum U.S.A. '87. Las Ve-gas, March 23-25 — Contact: International Data Base Man-agement Association, Suite 104, 9740 Appaloosa Road, San Diego, Calif. 92131.

National Capacity Planning Conference. Washington, D.C., March 23-26 — Contact: National Capacity Plannin Con-ference, 3825-1 South George Mason Drive, Falls Church, Va.

Walker Inter/Actions Users Conference. Denver, March 23-26 — Contact: Walker Inter-active Products, 100 Spear St., San Francisco, Calif. 94105. tact: Innovative Systems, Inc., 341 Fourth Ave., Pittsburgh, Pa.

> Computer Audit, Control and Security. Boston, March 23-27 — Contact: EDP Auditors Foundation, Inc., P.O. 88180, Carol Stream, Ill. 60188.

Datacon '87. St. Louis, March 24-25 — Contact: Datacon, P.O. Box 1401, St. Louis, Mo. 63188.

I/O Interface '87. Gaithers-burg, Md., March 24-25 — Con-tact: William E. Burr, National Bureau of Standards, A216 Technology Building, Gaithersburg, Md. 20899. Third International Confe

ence on Computerization of Medical Records. Chicago, March 24-27 — Contact: Regis-trar, Institute for Medical Re-

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cord Economics, 121 Mt. Ver-non St., Boston, Mass. 02108. Pirst Ave., Needham, Mass. 02194.

1987 SIM Institut Member Conference. Miami, March 25-27 — Contact: Society for Information Manage-ment, Suite 600, 111 E. Wacker ive, Chicago, Ill. 60601.

Electronic Data Inter-change. Arlington, Va., Feb. 19-20 — Contact: TDCC, Suite Inter-712, 1101 17th St. N.W., Washington, D.C. 20036. Also being held March 26-27 in Washington, D.C.

12th West Coast Computer Paire. San Francisco, March 26-29 — Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

# MARCH 29-APRIL 4

The Inevitable Partner Atlanta, March 29-April 1 — Contact: Life Office Management Association, 5770 Powers Ferry Road, Atlanta, Ga. 30327.

EFTA Expo. Las Vegas, March 29-April 1 — Contact: Electronic Funds Transfer Association, Suite 1000, 1726 M St. N.W., Washington, D.C. 20036.

Management Information Systems for Strategic Ad-vantage. Philadelphia, March 29-April 3 — Contact: Office of Executive Education, The Whar-ton School, 200 Vance Hall, University of Pennsylvania, Phila-delphia, Pa. 19104.

Applying the Records Man-agement Technologies. New York, March 30-April 1 — Contact: American Management As-sociation, P.O. Box 319, Saramac Lake, N.Y. 12983. Also being held April 13-15 in Chicago.

Reducing the Cost of Soft-ware. Washington, D.C., March 31-April 2 — Contact: Perfor-

mance Engineering Services, P.O. Box 9802, Dept. 120, Austin, Texas 78766. The 1987 National Confer The 1987 National Conference on Data Processing Quality Assurance. Chicago, April 1-3 — Contact: Quality Assurance Institute, 9222 Bay Point Drive, Orlando, Fla.

1987 Computer Dealers & Lessors Association Spring Meeting, Orlando, Fla., April 1-4 — Contact: Computer Dealers & Lessors Association, 1212 Potomac St. N.W., Washington,

Networking: The Large Organization Perspective. Mel-bourne, Fla., April 2-3 — Con-tact: Harris Briefing Center, 1025 W. Nass Blvd., Melbourne, Fla. 32919.

# APRIL 5-11

CHI & GI '87. Toronto, April 5-9 — Contact: Human Factors in Computing Systems & Graph-ics Interface 1987 Conference ics Interface 1987 Conference Office, Computer Systems Re-search Institute, University of Toronto, 2002 - 10 Kings Col-lege Road, Toronto, Ontario MSS 1A4.

The 1987 Eastern Simula-tion Conferences. Orlando, Fiz., April 6-9 — Contact: The Society For Computer Simula-tion, P.O. Box 17900, San Disen Calif 92117

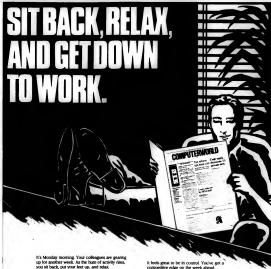
The 1987 Facsimile and Im age Communications Con-ference. Boston, April 6-8 — Interface '87. Las Vegas. Contact: Cap International, O March 30-April 2 — Contact: Snow Road, Marshfield, Ma The Interface Group, Inc., 300 02050.

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# COMPUTER INDUSTRY



# Sun peeks out

ly staged its own version of the climactic final scene of The Graduate when Sun Microsystems, Inc. drove up the Califor-nia coast to snatch Centram Sys-tems West, Inc. away from the altar and its imminent marriage to 3Com Corp. But unlike the wistful Dustin Hoffman riding of with his bride in the back of a lic bus, Sun Microsystems ears to have a solid future

In its five-year history, Sun as always seemed to be eclipsed y someone else's shadow. pollo Computer, Inc. pioneered the engineering workstation market, with Sun joining in later. And Sun's highly successful ini-tial public offering last year hard-

ly received the Innancial com-munity a sitention or a cover-spot on Fortune as did Micro-soft Corp. a stock sale. But Sun should be coming out of the shadows very soon— and with good reason. Chief Ex-ecutive Officer Scott McNealy said at a recent investment con-ference that the firm has hitched its wagon to three significant try trends.

rise of departmental computing, the move toward standards like Unix and Ethernet and the longed momentum of Unix it-

cized, but many influential users
— including Schlumberger
Ltd. (a Sun OEM), General Mo-. (a Sun OEM), General Mo-Corp. and Ford Motor Co.

ment requirements.

Many think of Sun primarily in the computer-aided design (CAD) arena, but in fact, CAD ALD areas, our ar-ed computer-aided engineering solirations accounted for just

year ended June 1986. Comput-er-sided software engineering,

FEBRUARY 16, 1987

# Policy Management deals from strength with IBM marketing pact

BY ALAN ALPER Since IBM became the exclu U.S. distributor of banking soft-ware from Hogan Systems, Inc. in Dallas last year, analysts have looked for Big Blue to sign simi lopers that have success



Both Hogan and Policy Man-agement are leading applications software suppliers to their re-spective industries, and both

ment," says G. Larry Wilson, Policy Management president chairman. The IBM alliance gives an

serve markets that are of vital significance to IBM. Banks and insurance companies are among the largest users of IBM equip-ment. Of Policy Management's the property and casualty insurance industry, "only one or two have even looked at DEC equip-ment," says G. Larry Wilson

# LONDON - Electronic Data Systems Corp. (EDS) claums it

has reached an agreement with British immigration authorities following investigations into alle ions that EDS tried to skirt UK minigration laws The controversy had clouded EDS's bid to design and run a

BY JOHN LAMB

**EDS** says

case closed

in Britain

government data communications network worth an estin ed 400 million pounds, or \$609 In 1985, a memo sent by an

EDS manager to U.S. employees instructed them not to reveal, as required by immigration laws that they were going to the UK to work. After discovering this, members of the British Parisment's opposition Labor party

Continued on page 90

Computer terminal stocks hold their own. Page 85.
 High-tech execs greet the

# Unisys plans relocation: layoffs likely

BY JEAN S. BOZMAN

ems Corp., a dev

DETROIT — Unisys Corp. enc ing its fo sais — selling major business units to offset the \$4.3 billion cost of merging Burroughs Corp. and Sperry Corp. This year, with an emphasis on consolidation.

single site in Rancho Bernardo, Calif., where the A 15 semiconis expected to be complete by mber. It may result in the nployees who worked at Sperry semiconductor

chips will have to take place at Rancho Bernardo. The plant is

described as a state-of-the-art facility, where Burroughs and Mo-

torols, Inc. participated in joint development related to the Bur-The decision to phase out nesota operations was

# MSA still high on mainframe sales potential

But Imlay broadens firm's base with vertical-market buying stree

BY JAMES A. MARTEN ATLANTA — Despite the ap

es in favor of high-end mini computers and supermicros, Management Science America, Inc. (MSA) is confident that IBM mainframe applications software

is leading the industry out of its "Users are no longer focusing on hardware," declares John P. Imlay Jr., MSA chairman and chief executive officer. "They

are now focusing on solving their business problems by developing a long-range information plan that complements their comp

that assessment, no one would disagree that MSA has weathered the recent slump well. The ome, along with a 28% jur

in revenue. Although MSA's 1985 net income was a modest 58.6 million, the company continued to report a profit through the last two utrabulent years, 1986: by acquiring smaller com-

MSA's 1986 rebound ue and income for the last five years

NUMBERS IN THOUSANDS



INFORMATION PROVIDED BY MA

panies with a strong presence in desired vertical markets and in creasing overseas marketing and sales efforts. MSA will also emphasize adapting its mainframe annication nackages to market and technology changes through a combination of internally fiment and joint ventures. Like other mainframe soft

are vendors such as Computer Inc Associates International Uccel Corp. and Pansophic Systems, Inc., MSA went on a buy ing binge in 1986. First, MSA tured into the IBM Systemi 36 and System/38 minicomputer arena by acquiring RTS Ltd., a Dublin, Ireland-based manufacturing and financial software

One month later, the comp ny announced it would acquire Information Associates. with software offerings for IBM mainframe and Digital Equip-ment Corp. VAX minicomputers in the higher education market. MSA saved its largest acquisi-

tson for last with Comserv. a manufacturing resource planning software vendor with pack Continued on page 89



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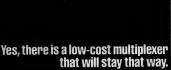
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Kathy Porteus

# Terminal makers step up stock

As the stock market maintains its quick tempo, selected segments of technology have not missed a best. One such area been computer terminal stocks. But lysts attribute much of the stock love for this group to diversification ef-erts by firms such as Wyse Technology, sc. (WYSE — 24%) and Telex Corp. (TC - 87%) rather than improvement in

rminal-market conditions. Sluggish demand for mainframes and supermicrocomputers has burt both IBM 3270-compatible and ASCII terminal businesses, according to Kenneth Leung of Smith Barney, Harris Upham & Co.

of Smith Barney, Harris Upham & Co. Nevertheless, terminal companies are at-tempting to circumvent such flat growth by offering fuller product lines. The lead-ing stock performers correspond with the companies that have most successful-ly diversified their traditional terminal siness, namely Telex and Wyse. Telex has scored with investors.

eung contends, because of its IBM

with its 3270 systems. Leung says these factors assure Telex's growth for the next ths even without a resurgence in domestic demand for mainframes, and

hence 3270 terminals For these reasons, Leung continues recommend the purchase of Telex, sich he estimates will earn \$5.30 per are in fiscal 1987, ending March 31, and

share in facal 1987, ending March 31, and \$7.05 per share next year. Smilarty, Wyse has become a favorite among securities analysts because of its smooth shift into systems and display monitors. Joel Houseman, an analyst with Robertson, Colman & Stephens, says nonterminal business accounts for 50% of Wyse's revenue and most of the compa-ny's growth. Despite adverse industry conditions, "Wyse has continued to de-

condutions, "Wyse has continued to de-liver the numbers," Houseman adds," and the outlook continues to be good." He estimates the company will earn \$1.50 for facal 1987, ending March 31, and \$1.95 per fully diluted share in fiscal 1988. Walter Winnitatio (L. F. Rothschild, Unterberg Towbin agrees that a major

reason investors have become interested in Wyse is its participation in the micro computer industry, which late last year attracted renewed enthusiasm from Wall Street. Yet Winnitzki maintains that

Wyse's accelerated order and revenu momentum reflects strength in all areas of the company's business, including AS

CII terminals. Winnitzki estimates Wyse will earn \$1.52 per share for the fiscal year ending March 31 and \$2 per share next year. His 1988 estimates assume flat margins

and revenue growth of 25% to 30%. However, he suspects his estimates might ove conservative, considering the

prove conservative, considering the company's recent quarterly growth of 57%. Both Winnitzki and Houseman of Robertson, Colman aggressively recom-mend Wyse. Winnitzki says Wyse still sellin at a 30% discount to the Standard & Poor's 400, even after its recent 50%

Behind Wyse, the big name in publicly traded ASCII terminal suppliers is Televi-deo Systems, Inc. (TELV — 2%). Yet to's stock has staved below \$4. largely because of lost momentum in the

terminal marketplace and unstable man agement. "Televideo's terminal prodagement. "Televideo's terminal prod-ucts are now much more competitive, and the company continues to ship more units," Houseman says, "but this still rep-resents a highly speculative estuation." Lee Data Corp. (LEDA — 8%) is an-other stock with a troubled history, but at has recently benefited from Wall

Street's notice of low-end hardware manufacturers. Lee Data's traditional busis is IBM 3270-compatible terms but it has diversified.

Houseman says Lee Data's momentum should begin coming through in earn ings. Houseman estimates Lee Data will earn 44 cents and 65 cents per share in fiscal 1987, ending March 31, and 1988, respectively

Durtous or rescribers of Crossel Burnston, Ave. cistes, a Centerville, Mass.-based company that vides customated research services for financial

# Three Wang VPs quit: more may go

BY STANLEY GIBSON

LOWELL, Mass. - Three Wang Labora es, Inc. vice-presidents have departed recently, fueling speculation that the moves were in response to the new regime of Frederick Wang, the son of the company's founder and longtime chair man and chief executive officer, An Wang Frederick Wang became president and

CEO last fall.

Samuel Gagliano, vice-president of the strategic marketing program, resigned effective Feb. 6. Two weeks before. Richard Connaughton, vice-president of voice product marketing, resigned. Connaughton was in charge of Wang opera tions relating to its Intecom, Inc. subsidiary and Telenova, Inc., in which Wang owns a 42% interest

Intecom, the Richardson, Texas of digital private branch exchange equip-ment, has been plagued by losses and may have been responsible for one third of Wang's \$30 million lose in the second er of fiscal 1987

Ralph Crusius, vice-president and as-sistant to Chairman An Wang, retired Jan. 30. "There are more changes coming as regions are combined. Some Imore! vicepresidents will go," said John McCarthy. an industry analyst with Forrester Re-search, Inc. in Cambridge, Mass.

# C Language Made Easy To Learn Programmers call it the most comprehensive C course

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Gil Rooder of Hands On Learning, who developed this remarkable workshop, says customers like C for its power and portubility, but this snags getting staff up to speed. "C can be tricky at first. On the job training is too slow and distracts seniors staff, Seminars (and travel) are too costly, and often disappointing".

coulty, and often disappointing."
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the acclaimed text "Learning to Progri in C" by Dr. Thomas Plum, internation authority on C and technical advisor Hands On Learning.

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# CONFERENCE NOTEBOOK

# Executives stress multivendor connectivity

# BY ALAN ALPER and CLINTON WILDER CHISTAFF

NEW YORK - The era of dispersed com ing has arrived. That was the message vered by executives of several lead computer and communications firms to in-vestors at a recent Goldman, Sachs & Co.

high-technology conference.

The paramount theme, according to the executives, is multivendor connectiv ity, whether within local-area networks (LAN), between mir computers functioning as departmental processors or via

Computer users, within work groups or between departments, need to be able to exchange information in a timely and cost-effective manner, the executives

Among the vendors making presentations were:

tions were:
3 Com Corp. In outlining the Mountain View. Cald., firm's plans, President William Krause stressed that 3 Com is not just a LAN vendor but also a supplier of work-group computing products.

In that vein, Krause said, the firm is in-

vestigating the development of an office network-station, a high-performance mi-crocomputer that would use application-

UST as we learned in PCs...workstations are not isolated islands of office automation."

> WILLIAM KRAUSE 2COM CORP

specific integrated circuits to provide built-in networking capability, integral nced graphics adapter cards and high-resolution monitors. Such a system would be akin to engi-

seering workstations offered by Apollo Computer, Inc. and Sun Microsystem and-would replace and/or co-exist with networked microcomputers. Krause declined to say when 3Com

would introduce an office network-sta-tion, or whether it would be produced internally or purchased from another ven-The need for such a product, he said, is

obvious within work groups that make up the base level of many firms' three-tered information structures. "Just as we learned in PCs, microcomputers are not stand-alone islands of office automation." he said, "so, ton, workstations are not iso-lated islands of office automation."

Krause pointed out that there is still much opportunity within the existing base of personal computer users. Despite all the talk of LANs, 77% of all PCs still oper-

ate in a stand-alone fashion, he said.

Ungermann-Bass, Inc. In line with
its goal to be "an information exchange company," Chief Executive Officer Ralph Ungermann said the Santa Clara, Cald., firm has begun to unbundle its software.

The Universal workstation product

provides users with access to a multiplicity of computing environments including IBM 370 and Digital Equipment Corp. VAX as well as Microsoft Corp. MS-DOS microcomputers.

The goal is to facilitate universal file transfer between disparate systems, he said "A hot key enables users to switch between the different computing worlds," Ungermann explained. Ungermann foresees incremental rev-

enue growth during the current quarter as a direct result of software unbundling, which began only a few weeks ago. "We ould know more as the year goes on,

National Semiconductor Corp. President Charles Sporck said the nearterm prospects for a semiconductor instry recovery are still hampered by

oversupply. "I don't believe we will see west-apply. In the the war see was see much relaxation of pricing pressure for some time," he said. "There is still too much overcapacity." He added that the overstocked inventory problem is more acute for the distributor channel than system OFMs

Although Sporck said the U.S.-Japan semiconductor trade pact means little if the Japanese continue to dump products in third-country markets, he predicted the agreement will eventually benefit U.S. vendors. "It's going to work because it's in the best interests of Japan to make it work," he said. "The U.S. is serious about this issue, and the Japanese have m more to lose in a tra war than we do.

Sporck predicted IBM's recently an-unced 3090 Model 600E will actually help sales of National Advanced Systems comparable AS/XI, 100 because custom comparable AS/AL 100 because customers have delwyed their purchases in anticipation of IBM's move. "It will spur the buying cycle again," he said.

Amdahl Corp. Chief Operating Officer Joseph Zemke called the \$890 CPU.

ounced last year, "the best product launch we've ever had." He said that within the past two months, Amdahi has signed four volume purchase agreements. nging from five to 20 processors. He also noted that the Sunnyvale, Calif., firm sold three systems in 1986 to formerly all-IBM shops.

# Presenting computers that:



ving you a five-fold power range in the 92 red-fold span of computing power within nily from the conveloped 93/0 to IBMh bit

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wise be at

# MSA sales

s running on Hewlett-Packard Co.'s 3000 minicomputer. Comserv has been merged into a new MSA division, Ad

"MSA moved too slowly for too long." says Curt Monsh, technology analyst with Paine Webber, Inc. "These acquisiwith Paine Webber, Inc. "These acquisi-tions largely compensate for that. They now have two strong vertical markets — manufacturing and education. But they need to be stronger on the DEC VAX and infrancial section — 2000 Markets."

financial services applications."

MSA faced eroding market share ser eral years ago, says Chris Mortenson software analyst for Alex Brown & Sons, Inc.'s New York office, but "they've more cently announced 9370. "We've moved than solved that problem now." Even as mainframes drop in popularity in favor of minicomputers, MSA is in a

strong position, since most manufacturers, accounting for 42% of MSA customers, continue to use mainframes, Mor-

son says. MSA will be devel acquiring vertical-market apations in retailing, bank insurance, according to Im-"We have a wish list, and we have a lot of cash." be says. adding that the company cur-rently has some \$85 million in the bank

DEC's VAX minicomputer and IBM's re-

into the System/36 and 38 market with RTS, and with the VAX coming on strong. you'll certainly see us in the marketplace as well," Imia In add

ion to future acou tions. MSA is planning several joint ventures. The first is an agreement with Aion Corp. of Palo Alto, Calif., in which MSA will incorporate Aion's artificial intelligence technology into several of its own mainframe

Imlay

applications and will jointly market Ason expert system according to Dennis Vohs, pres et of MSA Advanced Manufacturing In the future, every application pack-

age will have Al elements, Vohs says. Software companies not doing anything in that area are going to have real prob-lems in a few years," he maintains. MSA is positioned for adding AI capabilities as a

result of the expert systems features of its formation Expert technology, he adds. The company is currently negotiating int ventures with several hardware vendors for manufacturing applications, Volu-We have some 3,200 manufacturing

customers out of only 5,000 manufacturers that have mainframes, but there are hundreds of equipment suppliers. We're setting up some programs so those vendors looking for a large installed base can integrate with our software." he says. IBM's DB2 relational data base and SQL have become mainframe standards, and MSA has been working to integrate its applications with them, according to Vohs. Beta tests of MSA's General Ledger and Information Expert systems un-der DB2 and SQL began in November, and development will be continuing this

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# Sun peeks

accounted for 38% Sun appears to be serious about the markets of MIS applications development

year.

and office subamation. It entered a cont. marketing agreement with Wang Labora torses, Inc. — as did Apollo — late last year, and McNealy is proudly trumpeting Sun's 15 new customers in the Wall Street financial community. He also sa Sun is about to "unhook a customer's \$5 million mainframe order" by supplanting the box with a dozen of its 4 million in ructions per second, high-end servers.

Forty percent of Sun's business is through OEMs, mainly traditional factory automation vendors like Computers sion Corp. and Gould, Inc. But Sun claims that no one customer accounts for more than 10% of its sales, heeding a lesson learned the hard way by so many OEM suppliers In many ways. Sun is a throwback to the days when a Silicon Valley hardware company founded by a few white kids -McNealy is just 32 - could come along and dazzle the industry.

Sun is indeed growing fast — may be too fast. In its most recent quarter, the ming of a new production plant fueled a 173% gain in sales to \$115,3 million, while profits soared 405% to \$8.5 mil tion. Partly in an effort to staff the new plant. Sun is hiring new employees at the nheard-of rate of 200 to 250 a month Talk about ramping up.

Despite such heady growth, Sun ap

ears realistic about the increased compa tition it will face from vendors such as Hewlett-Packard Co., Digitial Equip Corp., Apple Computer, Inc. and IBM Apple's upcoming Open Macintosh has been dubbed the "Sun Killer," and

McNealy freely admits that the new Mawill eat into Sun's commuter-aided nubbshing market share. But that market was only 16% of Sun's business in the last Clearly, all the big boys would like to gam some ground in the workstation are no. But as that market continues to heat

un it appears Sun will shine even hotter

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# Case closed

FROM PAGE 81 called unsuccessfully for gr nt ministers to reveal wheth er prosecution was likely. Last week, EDS anno UK's Home Office — the depart-

"It was not a general EDS document," a company spokes-man said. "It was put out by a sinthat the company had accepted recommendations made by the

tion affairs - and that the mat-

The revelation of the employee memo came just as govern-ment computer departments be-gan initial stages of awarding a 10-year contract to integrate communications between four

government departments and a network supporting

The Government Data Network, as the project is called, is on in September the UK equivalent of the \$4.5 billion U.S. Federal Telecommunications System 2000 project, for which EDS is also com peting. EDS, in partnership with Northern Telecom, Inc., is on a list of five consortia bidding for

the Government Data Network. A list of final bidders will be an ed later this month. Worl on the network is expected to be-

Despite promised expansion in the UK. EDS has so far failed to buy its way into the UK software business after an abortive bid for London-based Logica, Inc. in 1985. EDS reported Euronean revenue of anoconimate-

ly \$250 million in 1986, with \$100 million from the UK.

The firm has been trying to increase its European activities Late last year, EDS successfully acquired SPL the software and services arm of France's metals giant Pechiney S.A.

Larabas a London-based correse for the CW Communications Internation at News Service

# ment responsible for immigra-EDS boasts strong profits for quarter

# BY ALAN ALPER

DALLAS — Strong growth in its non-General Motors Corp. busi-ness helped Electronic Data Sys-tems Corp. (EDS) register a 25% increase in fourth-quarter prof-its of \$71,5 million, or 58 cents a

Revenue for the period énded Dec. 31 was \$1.15 billion, up 7% from the previous year's level. The strong quarter contributed the strong quarter contributed to a year-end profit of \$260.9 million, or \$2.13 a share, up 37% from 1985. Revenue for the year jumped 27% to \$4.37 billion.

Analysts said EDS's strong fourth-quarter performance pri-marily resulted from growth in non-GM business, putting to rest concerns that the data processing and services firm had lost its competitive edge. Non-GM business was up approximately 25% in the fourth quarter from the corresponding period last year,

tting closer to AT&T benefited from a host of federal, state and local government

contracts, as well as agreements ed with health care and inance firms throughout 1986, Dalias firm said. The firm also expanded its relationship with AT&T and signed contracts with a number of international ing the year, the firm added

ded an eight-year U.S. Air Force contract, an eight-year contract to automate the office of the U.S. Secretary of Defense, a five-year agreement with Isuzu Motors Ltd. in Japan and a con-tract with Midland Bank PLC in

EDS is in the second year of EUS is in the second year of updating and integrating all of GM's data processing systems and is developing manufacturing simulation systems for the auto maker. The firm is streamlining GM'a benefits systems, con dating its 50 data proces centers into an integrated net-work of 14 larger facilities and creating a single global commu-



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# 8:30 A.∏. → TOKYO. JAPAN

IDG's International Data Corporation managing director 'Yag Ogano' is stopped in his tracks by a flash report on the company's International News Service. Digital News has just a sported a potential challenge to IBM's gift on the professional PC modern and the professional PC modern and the professional PC modern and professional PC modern and



# 8:40 A.M. → SYDNEY, AUSTRALIA

At almost the same moment 4,300 miles to the south. Computerworld Australia publisher Susan Coleman sees the DEC story on her news wire. She calls in Peter Scott, her editor, to plan editorial coverage for their market.



# 11:00 P.M. HELSINKI, FINLAND

Halfway around the world, **Timo Tolsa**, editor of IDG's Finnish computer newspaper *Teconylibo*, Yo, Eases his comments on the pending story to **Dieter Echbauer**, editor of *Computerwoche* in Germany, who appoints an editorial team to file a comprehensive story for use by all five IDG publications in Germany.



# 10:10 8.7. \* BUENOS AIRES, ARGENTINA

Ruben Argento, the head of IDC is Computerworld newspaper in Argentina uncovers a new wrinkle in the rapidly unfolding story—and aleris Doane Perry, senior market consultant at IDC in Framingham, Massachusettis: a DEC competitor in South America is developing a similar cluster product.



# world just changed again.

# 10:30 A.M. → BOSTON, MASSACHUSETTS

IDG reporter **Kathryn Esplin** files a VAX Cluster story for *Digital News*. Her back-up analysis is sent to all publication offices around the world on the company's news wire.



# ⊇:□□ P, P, \* FRAMINGHAM, MASSAC

Perry meets with Bill Ford, IDC Information Industry Services Chief, to plan a global research report on computer clusters and their potential impact on business users.



# 4:45 P / P ALO ALTO, CALIFORNIA

IDC Research Director Jean Yates faxes detailed schedules of the report requirements to IDC research centers in 16 other countries. Deadline: 1 week. Overnight mail announcements of the pending report are mailed to IDC's top 1,000 customers around the world.





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# Policy

aura around something a compa-ny has developed." notes Chris Mortenson, an analyst with Alex Brown & Sons, Inc. in Baltimore. "It's as if IBM has blessed some-

er, the OEM agreeement IBM er, the OEM agreeement IBM signed with Hogan last spring [CW, May 12] has many more dif-ferences than similarities to its IMAP arrangement with Colum-bia, S.C.-based Policy Manage-

For one, Policy Management is not limited to an exclusive working relationship with IBM under the IMAP agreement, and it retains marketing rights to its products. Hogan gave up domestic marketing rights to its prod-ucts to IBM in return for royalty payments, which analysts have mated at 40% to 50% on

Policy Management, on the other hand, gave up its IBM value-added reseller status for its role as an IMAP partner. The firm will receive commissions of

less than 10% for each joint sale the two companies make on IBM hardware, according to Wilson. Policy Management will also get an unspecified commission on strategic software components licensed with hardware, such as DB2, SQL and librarycontrol facilities, notes Don Cog-giola, Policy Management exec-

utive vice-president of field oper-Another difference between the two situations is the financial vherewithal of the two software elopers. Hogan had suffered h a string of well-publi-inancial problems before through a string of web-poin-cined financial problems before giving IBM the right to market its software. Although Policy Management's profits dipped 5% last year, the firm still earned

\$13.6 million on revenue that grew 46% to \$150.6 million. Both situations also refle IBM's move to strengthen its financial performance by increasing its emphasis on software. Analysts expect IBM to build additional alliances with other software firms this year, dubbed its "Year of the Customer

IBM has not moved fast' IBM has to derive a larger percentage of its revenue stream from software and services, as they have not moved fast in that regard," notes Rick Sherland, an lyst who follows the software iness for Goldman, Sachs &

Co in New York IBM's glaring lack of strong insurance industry applications

software could be the reason it has aligned itself with Policy Management, "At worst, this is deal struck between equ You could argue that IBM need-ed Policy Management more than vice versa." Alex Brown's

Although an IBM spokesman. refused to comment on the agreement. Charles Buchheit. director of the insurance indus-try for IBM told Policy Management's company newsletter, "When we identify an opportunity, the IBM marketing represen-tative can bring Policy Manage ment into the market situation. Policy Managem marketing may also identify an opportuni and initiate IBM's involvement

While not bundling Policy Management software, the cooperative marketing arrange-ment should help IBM sell more 9370s to the insurance business, Sherlund says. "It will give them instant help in the mid-range." he suggests. "There, you need a es effort

By working with Policy Man-ement, IBM should be able to etter understand the needs of the insurance industry. In that vein, IBM is said to be restructuring its field sales force on an industry-specific basis to foster a closer relationship with its cus-

# Unisys FROM PAGE 81

the result of a comprehensive evaluation of its existing semi conductor capability in relation to future product requirements and desired business methodol gy," according to a company Approximately 100 of the

workers will probably be relo-cated to Rancho Bernardo, sc-cording to Unisys, while the rest services of a national relocation company. "This is part of our continuing effort to consolidate operations and to downsize the company," a corporate spokes-

man said.

Unitys is now saying it is a \$9 billion corporation with 98,000 employees worldwide.

The Minnesota employees had staffed two former Sperry

semiconductor facilities: a de-fense-related facility in Eagan, Minn., and a Unisys 1100 main-frame facility in Roseville, Minn. Unisys intends to find anoth

Bernardo facility, which is where very large-scale integratio chips are made for the compa integration ny's A series m

ing the A 15.
The move follows several other initiatives to consolidate oper-ations from the Sperry and Buroughs sides of the con Two other examples are the re-cent consolidation of all artificial intelligence development activi-ties and all Unix software devel-

coment projects.

Morgor stops incomplete "Effectively, we completed the major reorganizational moves by Jan. 1." the Unisys spokesman said. But he added that some areas, such as redeployment of the U.S. marketing force and cross training of maintenance engi-neers, will take months to com-

In order to promote a unified image of the company, press spokesmen from Burroughs and Sperry held their first extended meeting together last week in Blue Bell, Pa. But that will not be the last

word in reorganization. "The fi-nal step will be the complete use for the Eagan plant, which houses about 240,000 square feet of working space. changeover of all Sperry and Burroughs signs," the Unisys spokesman stated, "and that may take up to three years to complete." It is nearly as large as the 280,000-square-foot Rancho

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# Migration hard for users

Many choices, few tools to move from System/36

BY STANLEY GIBSON

Users of IBM's System/36 minicomputer seeking more power confront hard choices, ranging from converting to an IBM System/38, ordering an IBM 9370 or moving to another vendor's

nt. atter which option users decide on, each requires a com-plex conversion. And looming over the horizon is an as yet un announced, but much discussed, future System/38 machine. Despite IBM's efforts to mar-

ket the System/36 and 38 as a 36 users who convert to a Sys tem/38 seldom do so without major difficulty

"In the past, all conversions have been described as bloody at best," said Rodger Peck, a Sysint and preof Peck Systems Group in Bridgman, Mich.
Last June, IBM announced
software that would convert System/36 code to run on the System/38. The bridge is viewed by
some as a temporary patch and s

prelude to a more complete ma-chine that will amalgamate the two architectures, to be introduced next year. One user was told directly of

the machine when he was mak-ing a decision on converting to a system/38. Gerard DiStefano. MIS director for Standish, Ayes and Wood, Inc., an investment management firm in Boston. traveled to Rochester, Minn., for a briefing on the future of IBM's mid-range. DiStefano was told that the System/38 CPU will be further expanded and will be the foundation of the combined Sys-tem/36 and 38 line through the 1990s. And the capabilities of the System/36 will be blended

They indicated the Syste 38 architecture was the wave of the future and a new box would he out in 18 to 24 months. It sounded like the System/36 Model D was the end of the line. mid. An IBM spok suld not comment on what Di

efano was told. The MIS director ultimately opted to move to a System/38, even though doing so will mean facing severe obstacles. severe obstacles. Stefatio is allowing approx

mately one year for his conver sion from the System/36 to the 38. In the process he will rewrite some 1,500 programs. He will also continue to use a System/36 38. This will present some problems in that a System/36 uses will be able to access documents on the System/38 but will not be

DiStefano said he has confidence in his decision, despite be-ing told by IBM that it would be possible to upgrade from the stem/38 he will soon own to the coming machine

Aligration 'bugs me' DiStefano termed the impossibil-ity of a hardware migration "very unfortunate. It bugs me." Nonetheless, he was assured that CPF and RPT3 software will run on the new machine. "Our investment [in software] won't he wasted," he said.

Some consultants maintain that going to s 38 is the least painful option facing System/36 painful option facing System/36 users who are running out of capacity, "While the System/36-to-38 conversion is difficult, it will be less traumatic than going to a 9370 or another vendor," said Charles Massogits, portion said Charles in East Language, Mich. He said that he allows 90 days for a fall conversion from a

ivs for a full conversion from a System/36 to s 38. 'It is not an sutomated con-

version. There is manual work involved," he stressed, despite the fact that a user may employ BM's code-conversion facility. And despite speculation that the System/36 will be eclipsed by the new System/38-based machine and that the System/38 9370 line, IBM is evidently make

ing a large marketing push in trying to sell the System/36. One industry analyst report-ed that IBM has assigned sales entatives to do nothing but sell System/36s in compet tive situations. Another observer said IBM reps are being given stem/36 quotas to meet, rather than a cumulative dollar figure that could be attained by selling a

For users who buy the System/36 now, the shifty of its software to run on the future System/38 machine would appear to he critically important. Users like DiStefano have been red that will be the case. And consultants such as Massoglia, who work closely with IBM ma-chines, are convinced that IBM will continue to foster three artem/36 and 35, the 370 and the

form for software written for current System/36 and 38 ma-However, John McCarthy, an dustry analyst with Forrester esearch, Inc. in Cambridge, ss., offered a differing view. 'I wouldn't migrate to the System/38 with the 9370 coming. I'd go to s DEC VAX or a Wang Laboratories, Inc. VS, becau those are the strategic products

Criminal past

ecutive Committee," said Tom Doeppner, chairman of the institute's Capitol-Area Executive Council. "I don't feel it's incumbent upon me or anyone else in the IEEE to notify our people about anything either good or bad in someone's personal histo-ry," Doeppner said during a rent phone interview.
Of the 30 or 40 members who

were present at Rifkin's election, none has formally protested his candidacy before the associa-tion's Ethics Committee, although "probably at least half Doeppner said.

What some of the local 44

EEE members do find objec-tionable, however, is the sec-tion leadership's suppression of possibly relevant informaof postury retevant monus-tion about a candidate's pro-fessional background. Much of the rank and file was us-sware of Riffin's former Ss-curity Pacific ties, even as be history." was running for office. Las May, he succeeded in his ef fort to win election as a sec

tion director — a post he is scheduled to hold until mid-1988 when his two-year term "I'm probably one of the few

people in the local organization who did know about Rifkin's background," said Stuart Katzke, an IEEE member and National Bureau of Standards (NBS) security specialist.

'No reference' Rilkin declined to resp

rectly to questions about his and the IEEE's failure to inform its members about his background. Ray Pickholtz, vice-president of the IEEE's Comm Society and professor of electri cal engineering at George Washington University in Washington, D.C., said he did not know shout Rifkin's background. Al though Pickholtz votes regular! in the association's el n the association's elections 'no reference to Mr. Rifkin as as

ex-convict ever came to my at tention." he said Because most IEEE memb

association's sections, which are primarily administrative bodies, the vast bulk of Rifkin's constituents "probably have no idea who he is," Pickholtz added.

Nor is his relative anonymity confined just to his own back-yard, where he heads McLean, Va.-based Master Systems, Inc., s systems consulting company. When reached recently by phone at the association's New York headquarters. IEEE President Brano Weinschel denied any knowledge of Rifkin's previous

scrape with the law. For the most part, the local IEEE members who already know about Rifkin's criminal rec-ord have few qualms about his rent position per se. "People

DON'T feel it's incumbent upon me or anyone else in the IEEE to notify our people about anything either good or bad

IEEE'S CAPITOL-AREA whether he has, in fact, done EXECUTIVE COUNCIL SO

who make amends for their past mistakes deserve a seco for the rest of their lives," Katzke said. Among the most ve-cal critics is locally based IEEE fellow Carl Hammer, a retired Sperry Corp, luminary. The section's top leaders failed "to tell

e whole truth and nothing but e truth," Hammer said. To support his contention, Hammer cited two omissions in

Hammer cated two omissions in the official printed announce-ment of Rifkin acandidacy. In the April 1986 issue of its monthly publication, "Scanner," the section ran thumbnail biograes of Rifkin and eight other asniring local officeholders Although Rifkin's material

fessional experience, it con-tained no references to his im-prisonment. Moreover, of the nine announcements, only Rif-kin's lacked a photograph, which "might have made him recogniz-

able," Hammer said.

During a brief interview last rek, Rifkin blamed the absence of his photo not on any attempt to avoid recognition but on technical problems beyond his control. "I sent them my picture in time to make their publication deadline, but they couldn't use it because of poor contrast or something like that," he said. "Scanner" Editor Jim

other, however, rem the incident somewhat different "With the press of his other business, he just wasn't shie to find a place to make a picture that he could get to me on time,"

Strother said. Hammer's view that the sec to's officers erred in withhold ing information about Rifkin and the Security Pacific affair

is shared by the NBS's Katake. "Whenever an ex-convict runs for office in a professional association, it's in mbent on the appropriate icers to inform the mem bership of his full back-ground." he said. "I'm willing to forgive someone who has truly reformed, but I'd like to TOM DOEPPNER make my own decision ab

to comment on the issue, re-ferred the inquiry to others in

Permissible under bylaws IEEE's Doeppner said that Rifkin's election is permissible un-der the institute a bylaws, which contain no provisions expressly forbidding an ex-convict from holding an IEEE office.

Some of the local section's rank and file find Doeppner's point about the bylaws compelng. "If our own rules permit s felon to serve in an official capacity. I guess I don't have any prob-lems with it." IEEE member Denny Bransted said

According to the brief biogra phy that accompanied the formal ncement of his candidacy, Rifkin has served successively as vice-chairman and chairman of the IEEE Computer Society's lo-cal chapter. In the latter role, he once shared an award for running the section's best cha

# Paperback Software adds graphics package BERKELEY, Calif. - Paper move portions of a drawing as whole segments, rather than as fragments of the picture that screen images accurately reflect

- assuring a hardware platbock Software International will announce in March an object-oriented business graphics pro-gram, VP Graphics, that will im-plement apreaduheet files in a variety of chart designs. Unlike some other presenta

object-oriented rather than ras-ter-based, said Steve Cook, proj-

tion graphics packages that run on the IBM Personal Computer and compatibles, VP Graphics is VP Graphics also offers what you-see-is-what-you-get, so that The user can manipulate or

fragments of the picture that leave a hole when removed, im-ages are saved as whole objects rather than bit-mapped parts. The \$99.95 program reads PC Giles from VP Planner, a pa-perback software spreadsheet, Lotus Development Corp.'s 1-2-3, and similar formats, Cook said. VP Graphics can also generate charts from DF and ASCII files. VP Graphics also offers what-

the printer or plotter out; The program suppo Microsoft Corp.-compatible mouse, as well as IBM Enhanced Graphics Adapter, Color Graph-ics Adapter and Hercules Com-puter Technology, Inc. graphics VP Graphics will have a driver

that can communicate with any printers or plotters that use Adohe Systems, Inc.'s Postscript escription language.
PEGGY WATT

# STOCK ADING INDEX W(FX 0040080840802088828882808380288000834444 8/13 271 This Week 138.1 160.8 131.3 Last West 136.1 puter Systems lies & Accessories 157.8 Software & DP Services 126.6 miconductors 106.3 127.6 117.2 100.1 erals & Sub 125.9 ng Compani osite Index 113.3 116.3 116.8 500 Index 167.2 166.0 SSESTER SHENSKER MET 4953800380031100521387003111005287100508030875802702558852580011001 \*221210034006:204110400100007181107:-7522115072880125167450050018112 日本の日本の日である MUNICAS ON -05

# Stock trading summary



# Chip stocks seesaw

Semiconductor firms ride waves of investor perception

Semiconductor stocks last week provided a lesson in how industry perceptions affect

rket activity. On Tuesday, the stocks took a besting after the Semiconductor Industry Association (SIA) urged stricter enforcement of last summer's trade pact with Japan; investors inter-preted the SIA piez as a negative sign for in-

dustry prospects.

On Wednesday, however, stocks surged on the expectation of a strong January book-to-bill ratio to be announced by the SIA. But when the ratio was below expectations, the

chip stock prices fell accordingly Giving the changes in price each day and Thursday's closing price, two examples of this phenomenon are Texas Instruments, Inc., down 615, up 7, down 316, close 15516; and National Semiconductor Corp., down 16.

up 1, down %, close 14 %. Often, however, a stock is affected much more by overall market trends than by spe canc company or industry news. Cray Re-

search, Inc. fell 14 on the day st introduced four supercomputers but rose 14 to 119 on Wednesday when the Dow Jones Industrial Average gained almost 14 points.

109

# Ingres for PCs allows data base access

BY DOUGLAS BARNEY

ALAMEDA, Calif. - In a move aimed at broadening its distrib-uted data base strategy and off-loading applications developent to less expensive systems, elational Technology, Inc. this eek will formally announce Ingres for personal computers. In-gres is a line of data base prod-ucts, based on IBM's SQL, that run on Digital Equipment Corp. VAXs, IBM mainframes and

Unix-based systems.
With Ingres for PCs, the firm now hopes to provide data base access and development across

tures.
The product has been extensively beta-tested with more than 1,000 copies already in the field. A typical implementation of the PC product will sell for \$1,200 to \$2,000 and will be Ne next month according

dahl's E series provides a dimen-sion of user friendliness that the rival BBM migration scheme lacks, according to Kimbole Brown, an analyst with San Derow, an analyst with San Derow, and analyst with San Gentle Calif. based Dataquest, Inc. Universely of the Company of the term to BBM method, users are problished from upgrading cur-rent 3090s to the corresponding E systems. Instead, customers, are forced to correlate to the

are forced to graduate to the

are incent to granuate to the next highest model number. Amdahl 5890 customers who want a modest increase in per-formance can upgrade to an equivalent E-series CPU without

operations manager at South-land Corp., the Dallas-based owner of the 7-Eleven conve-

owner of the 7-Earven conve-nience store chain, who manages an IBM 3090 Model 200 and an Amdahl 5890-300, said of the Amdahl arrangement, "If all you

have to do to get 4% to 13% more performance is switch

ng boxes. Larry Williams

Amdahl

FROM PAGE 1

to the firm.

Gary Morgenthaler, chairman of Relational Technology.
said the product is aimed at Fortune 1,000 accounts and volume applications developers. The main thrust of the product is stand-alone use, and it is geared for sophisticated data analysis

opposed to transaction pr ing, Morgenthaler added.

Compatible with nead 
"One of the major areas where it 
will be useful is for development. 
RTI has worked hand to keep it 
compatible with the misicompater version," and Joeln Sala, 
a programmer and malyra to 
the data base development 
group of the Sala Deago Center of 
Computer Sciences Cerp. 
According to Salas, the development of applications on personal computers that are ported 
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nal computers that are ported

boards, your system will occupy less floor space, dissipate less heat and require less cooling than with an IBM enhance-

Amdahl also bridged the performance gap between its 5890-300, which reportedly executes 41 milion instructions per-sec-ond (MIPS), and the 70-MIPS 5890-600. Previously, users of the 5890-300 lacked a clear up-grade path. The 5890-400E, rat-ed at 58 MIPS, falls between the

5890-300E and 5890-600E, according to company sources.

In addition to plugging a hole
in Amdahl's product line, the
\$890-400E restores a competitive edge that suffered a blow
with the arrival of IBM's 3090300E. Previously, Amdahl

300E. Previously, Amdahl boasted greater performance with the 5890-300 and less expense with the 5890-200 than IBM's 3090-200, according to Phoenix-based Annex Research, President Bob Djardjevic.

But the three-CPU 3090-300E, which rivals the power of

help the firm save money. Saks has been beta-testing Ingres for

Another beta tester agreed.
"One of the areas I see Ingres for PCs as really having a use in is a developmental area. People can

develop entire applications away from the host machine. "When that application is fin-ished, they can put it up onto the VAX," said Steve Almond, chief, VAX," said Steve Almond, chier, data base administration for Agri-culture Canada, an agency of the Canadian government similar to the Department of Agriculture. The product also works in a dis-tributed fashion, accessing In-

es running on larger systems.

The core of this strategy is the Ingres/Star, an open archi tecture distributed data base en-vironment, which allows for data to be shared between a variety of

architectures and operating sys-tems. "Ingres for PCs is a full rticipant in Ingres/Star rough its asynchronous inter-e." said Ed Forman, product manager for RTI.

The firm said it believes it can sell same 500 copies of Ingres for PCs per month. Senior Editor Charles Babcarb contributed to this proort

Amdahl's full-power dyadic of-fering, neutralized Amdahl's two-pronged strategy. Now, with a three-CPU system of its own, the firm's competitive posi-tion has been bolstered, Djurdje

Although a basic 5890-400E Although a basic 5890-400E costs 15% more than its closes 15% more than its closes 15% more than its closes 15% costs of 500-500 by 24%, Amdahl claimed. The 5890-400E supports up to 512M bytes of main storage and

A basic configuration that in-cludes 64 channels and 128M bytes of main memory, the 5890-400E costs \$7.275 million. Field upgrades to E-series models cost \$120,000. Deliveries of the 5890-400E and 5890-600E are stated to be-

gin during the fourth quarter, as opposed to a June starting date for the 5890-190E and 5890-300E. The first E-series machines to be available will be the 5890-200E, which begins shipments next month

N s .

Geing down the line. Inhancement to the BM KT PC and is two and node of the BM MTD department system. The second of the BM MTD department of the

artin' U.S.A. It goes by the name of Silver Surfer, and if he bets tester is right, it will become the dominant data on Apple's Michatton. Apple is the testing attention to the complete the surface of the complete the tives Surfer has over rivals in a cophisticated data base large that also has total control over Apple's Laserwiter, instell data base reports can take advantage of the dealton blaiking capabilities of the Macchools and the large print-

ody didn't listen. In a report on the slow of 1986 ge scandals, the U.S. House of Representatives' in-ce committee makes brief mention of the need for gence committee makes brief mention of the need for state computer and communications security is govern-it. The report anys senior U.S. officials are curriens ut their use of care phones, which are easy targets for chronic enventropping, and they convenience discuss sen-ematters over open and unaccurr communications. s. "The final go-sheed request for Navy sircraft to force to was ploused in the open to Air Force One," the report sts was ploused in the open to Air Force One, "the report

What's on first? The first public sign of the NCR Tower 32/ 200 arrival scentily where as NCR ODE customer, Rep-200 arrival scentily where as NCR ODE customer, Rep-admental scentilists and the scentilists of the scentilists 32,900, which is said to use multiple Moscrack 68,000 CPUs scentilists are scentilists and to use multiple Moscrack 68,000 CPUs scentilists are scenifished to the scenifished scenifished to scenifish 21,000 and spirit scenifished to the scenifished scenifished to scenifish scenifished scenifished scenifished and Reprofess claimed its 9000 supports 200 susers, compared with the 48 scenifished scenifish

A fifth cohomate? Would be light-test union organiser to Mann-American Free 112-64 to Common William Common Free 112-64 common William Common Free 112-64 common William Common Free Common Free 112-64 common William Common Free Common

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